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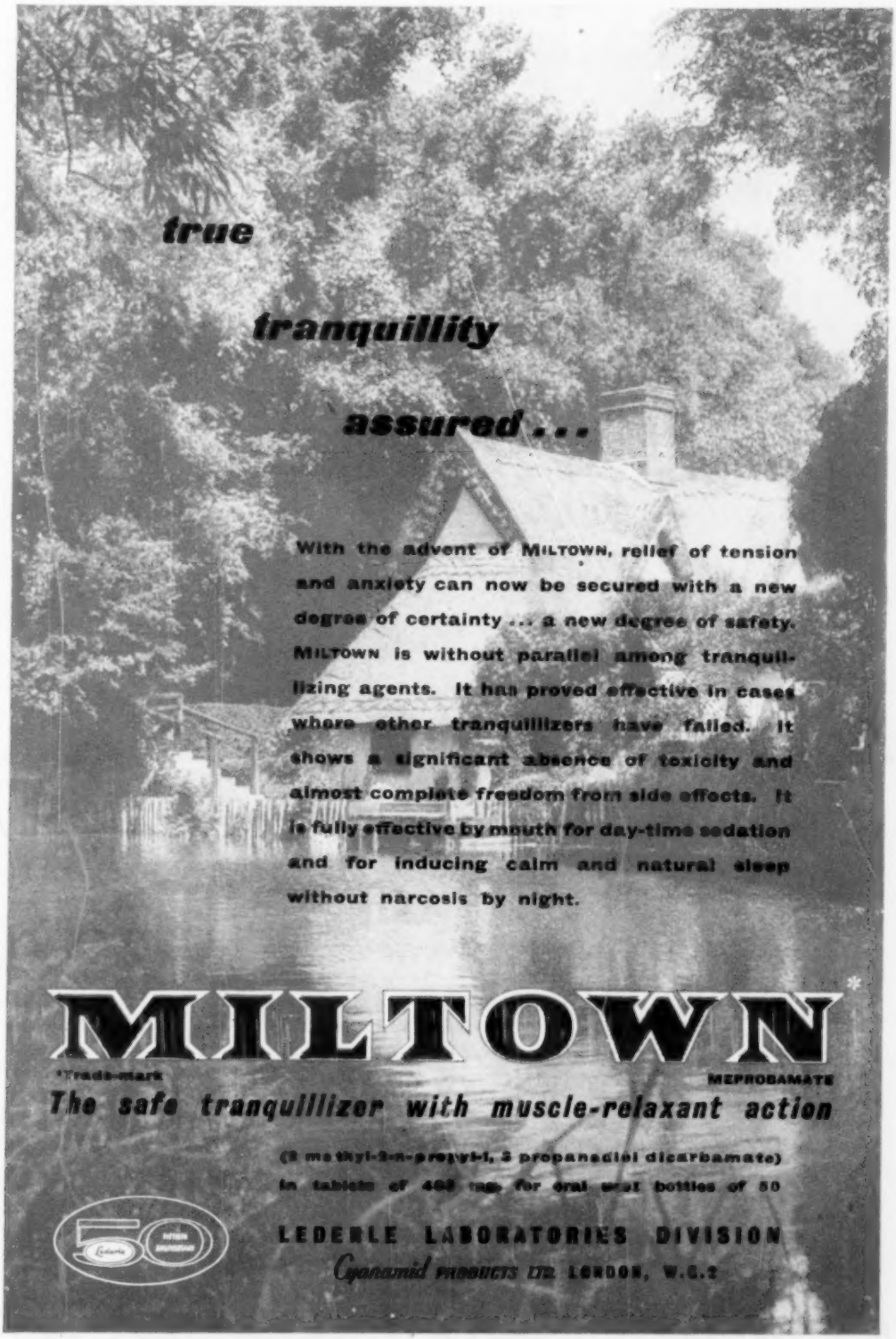
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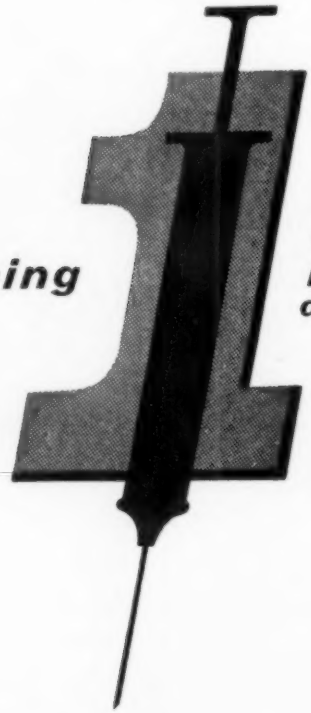

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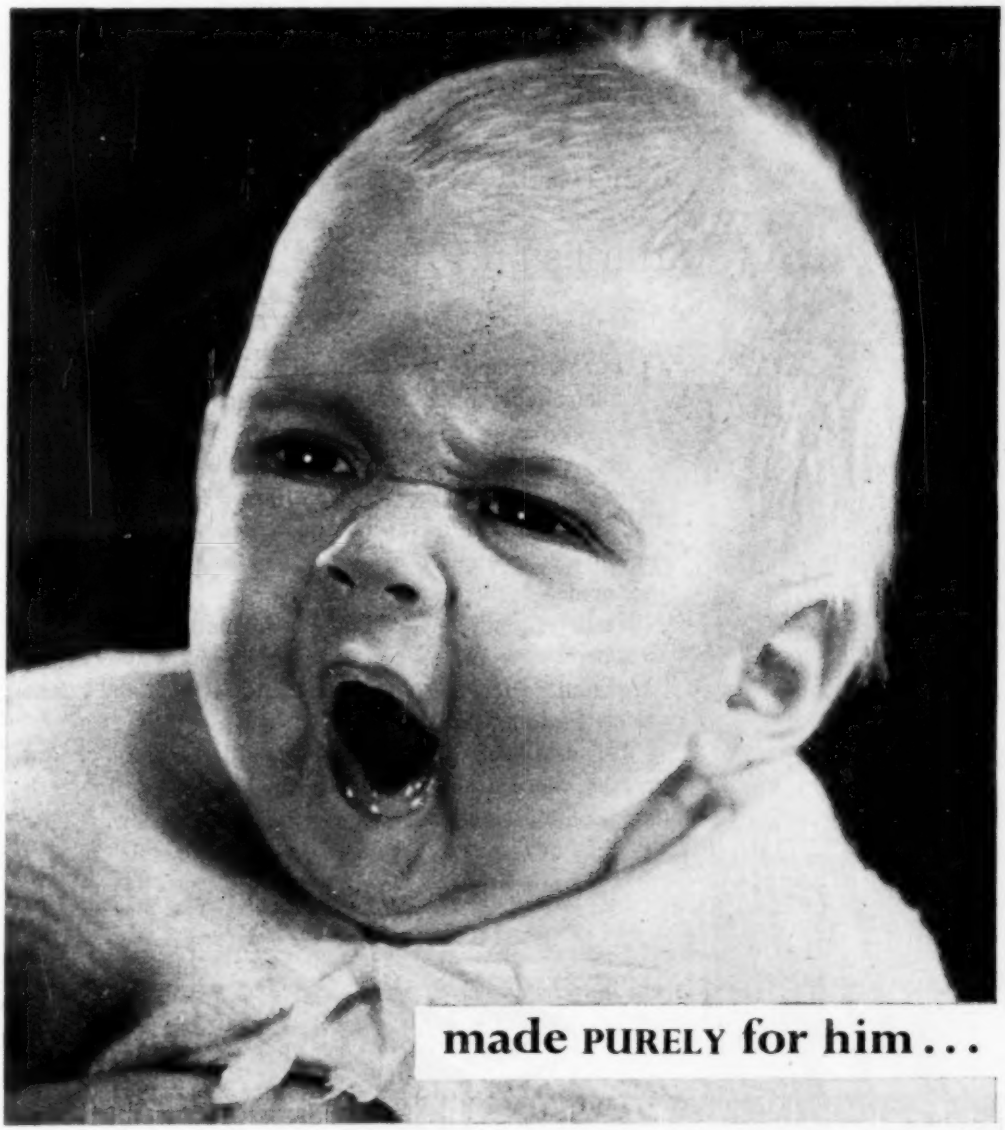


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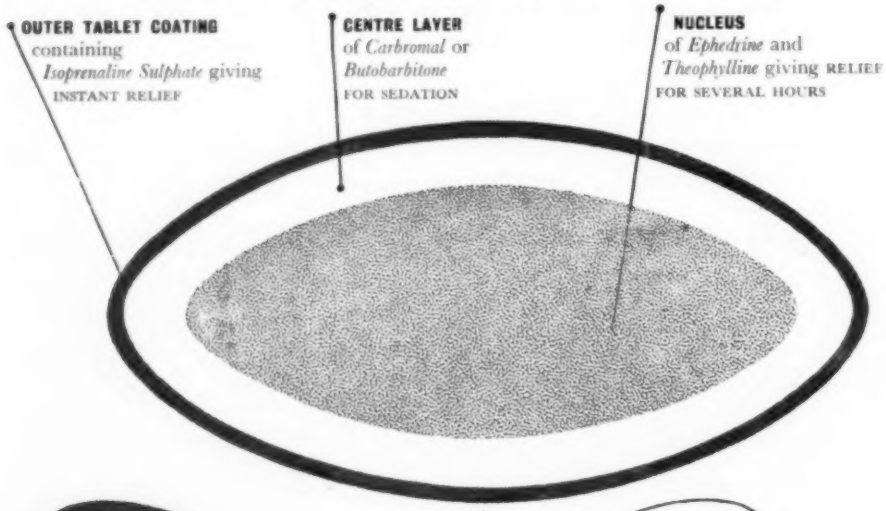


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# ZOONOSES AS A STUDY IN ECOLOGY

## WITH SPECIAL REFERENCE TO PLAGUE, RELAPSING FEVER, AND LEISHMANIASIS

BY

R. B. HEISCH, M.D.

*Senior Parasitologist, Division of Insect-Borne Diseases, Medical Research Laboratory, Kenya*

According to Karl Meyer (1942) the term "zoonosis" was first introduced by Virchow. In a recent publication of the World Health Organization the zoonoses have been defined as "those diseases which are naturally transmitted between vertebrate animals and man." Other definitions have been given from time to time, most of which are not very satisfactory. That given by the World Health Organization is probably the best, but it includes the word disease, which perhaps ought to be avoided, as in certain zoonoses one or more of the vertebrate hosts may show no symptoms of disease. In a recent textbook of protozoology it is even suggested that infections common to man and animals cannot be regarded as zoonoses when the animal host shows no symptoms. Chagas's disease, in which symptomless armadillos act as reservoir hosts, is given as an example. I shall try to refute this idea, and to emphasize that usually resistant or relatively insusceptible animals are the most efficient reservoirs of the zoonoses. It is of course not always easy to know when an animal is feeling ill, and a friend pertinently remarked, "How do you know the armadillo doesn't get a headache"; this was difficult to answer.

A simple definition which avoids some of the more obvious pitfalls is *infections of man naturally acquired from other vertebrates.* According to Metchnikoff, "Infection must be considered as a struggle between two organisms, the parasite and its host. . . . This struggle brings about adaptations on both sides."

A zoonosis can be considered in reverse, the infecting organism passing from man to animals and not vice versa. Monkeys are sometimes infected with quartan malaria and certain filariae in this way. Such infections might be called "anthroponoses," but the term is really superfluous, as most of the zoonoses show this quality of reversal. The zoonoses can be divided into two main groups: those transmitted by arthropods, and those which are not. Only the first group is considered in this paper.

### Evolution and the Zoonoses

Garnham (1952) has commented on the evolution of the zoonoses, and according to him the story is something like this. First, the parasite lives happily, passing between its animal host and arthropod vector; next, man breaks into the circle and accidentally becomes infected; the parasite flourishes in this abnormal host and may be transmitted by a more domestic vector—for example, flea or louse. The disease then often assumes an epidemic form, and may pass from man to man. Relapsing fever illustrates some of these points. The causative spirochaete seems originally to have been a parasite of merions, gerbils, shrews, and other small mammals, the vectors being ticks of the genus *Ornithodorus.* Man became involved in this cycle, and, after being bitten, developed relapsing fever; this still happens in North Africa and around Dakar.

It is worth trying to trace the evolution of *Spirochaeta duttoni,* which causes tick-borne relapsing fever in Kenya and other parts of tropical Africa, the vector being *Ornithodorus moubata.* Some years ago a spirochaete, named *S. dipodilli* and closely related to *S. duttoni,* was isolated from pygmy gerbils (*Dipodillus* sp.) and *O. erraticus* from small burrows on Crescent Island in Lake Naivasha (Heisch, 1950). Near the small gerbil burrows are large burrows, which are excavated by ant-bears, occupied by warthogs or porcupines, and often contain large numbers of *O. moubata* (Heisch *et al.,* 1953). The presence of *O. moubata* came as a surprise, for the ticks usually have domestic habits, frequenting native huts, rest-houses, and the camp sites of travellers; ant-bear burrows may be their original or natural habitat. It was thought possible that in the remote past the gerbil spirochaete might have become established in the "burrow-haunting" *O. moubata,* and then have evolved into *S. duttoni.* Unfortunately there is no evidence to support this possibility: specimens of *O. moubata* from burrows have always been negative for spirochaetes, and so have the few porcupines and warthogs examined. In Kenya and other parts of tropical Africa, even if there was once a reservoir host of *S. duttoni,* it appears to have faded into the background, tick-borne relapsing fever no longer being a true zoonosis; it thus differs from the disease in America, where man is infected in caves, various small mammals acting as reservoir hosts.

In recent years it has been found that certain tick-borne spirochaetes can infect lice (Baltazard *et al.,* 1947; Heisch and Garnham, 1948; Boiron *et al.,* 1948). Thus in Kenya strains of *S. duttoni* develop readily in lice, and infected lice have even been found in nature (Heisch, 1949). These results support the hypothesis, first suggested by Nicolle and Anderson (1927), that louse-borne spirochaetes evolved from tick-borne ones.

Other zoonoses, in which man breaks into a cycle in animals, are plague and leishmaniasis. Plague is primarily an infection of wild rodents, and man gets infected only by accident. In parts of Siberia gerbils are the

reservoir host of cutaneous leishmaniasis, which is transmitted by "burrow haunting" sandflies. Man sometimes gets bitten and epidemics have occurred among Soviet troops camped near infected burrows.

In Kenya kala-azar was almost unknown before the second world war. Early cases were sporadic, but in recent years there has been a severe epidemic in the Kitui District, and a smaller outbreak near Marigat in the Rift Valley. No animal reservoir has yet been discovered, and, though one may exist, it is believed that man is the usual host, and that interhuman transmission can occur on a large scale. In Kenya the epidemiology of kala-azar is highly complex, and at least three species of sandflies are suspected as vectors; these emerge from termite hills. Apparently evolution is still taking place, and it is difficult to know what the final epidemiological pattern will be.

### Holistic Tendency in Nature

It is evident from Professor Garnham's observations that in nature organisms may be parasites of man, of animals, or of both, and it is the last or zoonotic phase which concerns us here. The conception of a zoonosis is complex and includes an environment, as well as man, animals, sometimes arthropods, and a causative organism, the various parts forming a biological whole.

The importance of "wholes" has been stressed by General Smuts (1936). According to him there is a holistic (from ὅλος = whole) tendency in nature, parts combining into wholes, which in turn again combine, forming even more complex and significant wholes. A whole is not just the sum of its parts, but something more, something new; it is not just a mechanical system but "dynamic, organic, evolutionary, creative." The concept has little in common with the static absolutism of Hegel and other philosophers, and should not be confused with it. In nature, every organism, whether plant or animal, is a whole, and the modern science of ecology attempts to show how these various wholes react on each other, becoming linked, or rather combined, into new wholes, which are continually modified by changes in the environment.

A zoonotic whole is best considered in relation to the infecting organism or parasite, which makes use of some of the existing ecological links between man and animals in an environment, forming cycles or wholes of varying complexity. In fact, a zoonosis is really a small natural whole or holoid built, as it were, round an infecting organism. As already shown such systems, cycles, wholes, or whatever one prefers to call them, are seldom static, and at any time a zoonosis may cease to exist, the parasite becoming adapted to man and the animal reservoir fading into the background. Or the parasite, after passing through a zoonotic phase, may again become confined to animals, man fading into the background. Treating zoonoses as wholes in this way is useful, but perhaps rather artificial, as it depends on distinguishing between man and animals.

### The Zoonoses and Ecology

The foregoing remarks make it clear that a study of the zoonoses is essentially a problem in ecology. Ecology has been defined as the "study of interrelation between organisms and the environment." There are two approaches—the *synecological* and the *autecological*. Synecology, as the name implies, is synthetic or holistic in character, the various plants and animals in a community being treated as a whole, the parts of which are in dynamic relationship, and influenced continually by the environment. Autecology deals with single organisms or species in relation to the environment; it has more in common with physiology and is not really ecology at all. Clumsy words like synecology and autecology should be replaced by ecology properly defined in the true holistic sense.

Audy (1954) names the whole assemblage or array of parasites associated with a host population the "parasite-pattern," and includes under parasites "all those viruses, bacteria, protozoa, fungi, worms, and arthropods which live on or in or at the expense of higher organisms such as the vertebrates, whether harmlessly or harmfully." The vectors and causative organism of a zoonosis form part of a general parasite pattern, though, actually, while unravelling a zoonosis much of the general parasite pattern gets worked out as well. Many of the ideas tentatively outlined in this paper have been influenced by the opinions of Audy, who for a number of years has been working on the ecology of scrub typhus in Malaya. Audy has long appreciated the importance and holistic nature of synecology, and has discussed various aspects in an interesting note on medical geography (Audy, 1954).

The early work on plague in Kenya illustrates the limitations of an autecological approach. Everyone was so convinced that the domestic rat (*Rattus* sp.) was the reservoir host that it was considered in isolation and not sufficiently in relation to the wild rodents which are the real source of *Pasteurella pestis* (Heisch *et al.*, 1953). The working out of the life-histories of arthropods in the artificial atmosphere of laboratories also verges on autecology, and, though such studies have a certain value, they can never replace work in the field. Elton (1927) has pointed out that the discoveries of Darwin "had the remarkable effect of sending the whole zoological world flocking indoors, where they remained hard at work for 50 years or more, and whence they are now beginning to put forth cautious heads again into the open air. But the open air feels very cold."

### Host–Parasite Relationship

A most important aspect of the zoonoses and indeed of parasitic infections in general is what is known as the host–parasite relationship, by which is meant the nature of the interaction between the host and the parasite. It is suggested that the most important reservoirs of zoonoses and other parasitic infections are relatively insusceptible animals rather than highly susceptible ones. There is nothing new in this idea, and as long ago as 1926 that great protozoologist, the late Dr. Wenyon, wrote: "Whenever a parasite is discovered which brings about the death of its host in a short time, it may be safely assumed that the host is not a natural one, or that it is a natural one that is in some unnatural condition. After a time adaptation may occur and a host that was at first an unnatural one may gradually become a natural host."

Resistant animals are very important in plague. Thus in Kenya domestic rats (*Rattus* sp.) are highly susceptible and rapidly almost exterminated, while certain wild rodents (*Arvicanthis*, *Mastomys*, and *Otomys* sp.) are resistant and perpetuate the infection during enzootic periods. In South Africa two species of gerbil are involved (*Desmodillus* and *Tatera* sp.), one of which is resistant and the other susceptible. In California susceptible ground squirrels (*Citellus* sp.) die in large numbers, but the primary hosts are now believed to be various resistant field-mice (*Peromyscus* sp.) and wood rats (*Neatoma* sp.) which harbour *P. pestis* almost indefinitely. In Kurdistan the sole reservoirs of plague are highly resistant merions (*Meriones* sp.). For many years regions occupied by resistant namaqua gerbils (*Desmodillus* sp.) and merions were believed to act as barriers to the spread of plague, instead of being regarded as the real source of the infection.

Recently kala-azar has been extensively studied in Kenya, but, as already noted, no reservoir host has yet been discovered. If an animal host does exist, it may be so resistant that the infection can be detected only by special methods. When isolating *P. pestis* from wild rodents in Kenya (Heisch *et al.*, 1953), the pooled-tissue technique was employed, batches of spleens being emulsified and inoculated into guinea-pigs, for it was only by this indirect

method that the infection could be demonstrated at all. The same principle is being applied in kala-azar, the spleens of animals being inoculated into hamsters. Two hamsters actually became infected, one after being inoculated from gerbils (*Taterillus* and *Dipodillus* sp.) and the other from mongooses (*Helogale* sp.), but this may have been due to cross-infection in the laboratory. All known reservoir hosts of leishmaniasis, which include dogs, jackals, gerbils, and foxes as well as man, show a marked resistance to the infection.

Armadillos and antelopes, which harbour pathogenic trypanosomes, are excellent examples of resistant animals acting as reservoir hosts, the parasites causing no obvious symptoms. In the zoonoses mentioned in this paper the reservoir complex, or whole, includes arthropods as well as vertebrates, both helping to maintain the infection in nature. Sometimes, as in mite and tick-borne typhus, tick-borne relapsing fever, and perhaps certain virus diseases, the arthropod vector may be the principal host.

It is rather difficult to know what to call the various kinds of host. Perhaps resistant or relatively insusceptible animals might be termed "permanent hosts," and highly susceptible ones, "temporary hosts"; this would correspond to the natural and unnatural hosts of Wenyon (1926). Hosts can also be classified as "domestic" or "wild," and this may be important, as in many zoonoses the principal reservoirs are domestic animals, which bring the infection in close contact with man. The reservoir of a zoonosis is seldom just one animal, but usually includes several species, which are in close ecological association and act as a "zoological complex" or "biological whole." A good example is sylvatic plague in Kenya. At least three species of resistant rodents are involved, and these, acting in combination, probably perpetuate the infection far more efficiently than if one species acted alone. Highly susceptible hosts like *Rattus* are not included in the reservoir complex.

Hosts have also been classified as final or definitive and intermediate, depending on whether the development of the parasite in them is sexual or asexual. This results in certain ambiguities, and here the arthropod vector is regarded as the intermediate host, the final host being man or some other vertebrate.

### Niches

Resistant and unduly susceptible animals fill different "niches" in nature. According to Elton (1927), the "niche of an animal means its place in the biotic environment, its relation to food and enemies." The word "enemies" is taken to include parasites.

Elton has also remarked that "when an ecologist says, 'There goes a badger,' he should include in his thoughts some definite idea of the animal's place in the community to which it belongs, just as if he had said, 'There goes the vicar.'" On seeing an arvicanthis round Rongai one might say, "There goes an animal that can have plague without noticing it."

Important niches are filled by vectors of zoonoses. Thus in plague the niche is filled by fleas, in leishmaniasis by sandflies, and in relapsing fever by ticks and lice. A particular niche is usually filled by different species in different parts of the world.

A study of niches enables us to see that in their organization different animal communities have much in common. It also helps in forming analogies. Thus it was hearing that Dr. Baltazard had discovered resistant hosts of plague in Kurdistan that made me look for similar animals in Kenya. The term "habitat niche" has a different meaning in ecology, which is explained below.

### Focal Distribution of Zoonoses in Nature

A feature of certain zoonoses is their "focal distribution" in nature. This is well shown by plague, and, according to Karl Meyer (1942), "focal occurrence and discontinuous distribution is apparently one of the characteristics of sylvatic plague." While studying plague near Rongai in the Rift Valley of Kenya, a "focus" was found in a field, where *P. pestis* could be isolated from wild rodents long after the widespread epizootic had died down and the animals in adjacent fields had become negative. After the field was ploughed up no more infected rodents were found, conditions apparently being too unstable for the formation of a permanent focus. At Rongai "permanent foci" of sylvatic plague are believed to exist on the foothills of the escarpments where rodent burrows are relatively undisturbed, and not in the Rongai plain. The unstable plains in the valley are ideal for the dissemination of *P. pestis* when conditions are suitable, but the infection probably retreats to the foothills between epizootics. Dr. Baltazard (1955, personal communication) has found permanent foci of sylvatic plague on the foothills of the Himalayas; these never seem to form in the cultivated plains below.

Focal distribution is a marked feature of scrub typhus in Burma and Malaya. The vector mites are found in forest clearings, where they congregate, sometimes in enormous numbers, on patches of secondary vegetation known as "mite islands," often only a few yards across, in which the rodent hosts abound. When the mite islands are infected they are known as "typhus islands"; these are "erratically but not fortuitously distributed" (Audy and Harrison, 1951).

Relapsing-fever spirochaetes may also have a patchy or focal distribution in nature. Thus in Africa, where tick-borne relapsing fever is endemic, only some huts contain infected ticks. Other examples are *Spirochaeta latychevi* and *S. dipodilli*, which are parasites of rodents, and *Ornithodorus* ticks in burrows; the spirochaetes have a very patchy distribution, infected burrows being few and far between. Both the rodent spirochaetes are pathogenic for man, but only mildly so.

In parts of Kenya and the Karamoja District of Uganda, bush-babies (*Galago*) are believed to be reservoirs of yellow fever virus. Dr. Haddow, of the Virus Institute, Entebbe, informs me that infection in these animals is very localized, neutralizing antibodies being confined to groups or families of bush-babies living in widely scattered parts of the forest.

Focal distribution seems characteristic of most parasites in nature, but the ecological factors concerned are still largely unknown.

### Sites of Infection

Zoonoses are transferred to man and other vertebrates in a variety of places. Thus round Rongai man gets infected with plague in native huts, domestic rats (*Rattus* sp.) chiefly in village maize cribs, and wild rodents in burrows. In Kurdistan plague is almost entirely sylvatic, man being bitten by infected fleas near the burrows of merions. In East Africa tick-borne relapsing fever is contracted in huts; in America and the Middle East in caves. In Kenya kala-azar is probably caught away from houses near termite hills, while in India the disease is a domestic infection. In parts of Russia cutaneous leishmaniasis is transmitted to man near gerbil burrows by "burrow-haunting" sandflies. Yellow fever is often a house infection, but in Uganda man is infected in banana plantations on forest edges, and monkeys in forest canopies. In Malaya and Burma man contracts scrub typhus in forest clearings and forest edges.

These sites of infection show certain differences, some being unstable, others relatively stable. The plague-infected plain at Rongai and the forest clearings containing typhus islands are unstable areas, for man is continually ploughing up the one and cutting down the other. In fact, the balance of nature is always being upset. It is also doubtful whether the forest edges where man contracts yellow fever and scrub typhus are ecologically stable. In comparison huts, rodent burrows, caves, termite hills, and forest canopies are all relatively stable. Sometimes relatively stable habitats are present in an unstable area; they then partake of the general instability.

Ecologically unstable areas have certain characteristics. Plants and animals living in such zones are usually undergoing active succession, and are prevented from reaching that condition of relative stability known as climax. Species tend to appear that are absent from adjacent communities, and one or more species, whether present in adjacent communities or not, may appear in unusually large numbers. The occurrence of myriads of mites in the mite islands of Malaya, and the sudden appearance (when conditions are suitable) of innumerable wild rodents in the Rongai plain are examples of this. When such prolific species harbour parasites pathogenic for man his chances of becoming infected are much increased. Round Rongai it is only when the wild rodents are numerous that *P. pestis* reaches *Rattus* and finally man.

It is suggested here that it might be possible to call unstable areas "ecotones." The word is generally used, in a botanical sense, for transition or intermediate zones between adjacent plant communities. Might not this definition be too narrow? A striking feature of transition areas, marginal zones like edges, forest clearings, and cultivated plains is often their instability. The ecotone concept implies a state of tension in nature, a temporary or permanent loss of ecological balance. Ecotones may be man-made or occur naturally, as when places are periodically flooded, like certain river banks, mud-flats, and the sea-shore. A study of ecotones might throw light on the evolution of certain species. Audy and Harrison (1951) have pointed out that, in Malaya, rodents of the genus *Rattus* "have been greatly encouraged, and a number of commensal and subspecies have evolved in the artificial environments made by man."

A medical example of an ecotone might be the bowel of a patient suffering from dysentery. In a normal person the intestinal flora is in a state of equilibrium, but in dysentery and other infections of the bowel a single species may predominate and disturb the ecological balance. A similar effect may follow the administration of antibiotics. The elimination of susceptible organisms produces a bacteriological vacuum in which may develop a pathogenic staphylococcus, the life of the patient being endangered. Species of plant or animal which outstrip others and appear in abnormal numbers are comparable to cancerous cells, which defy the authority of the human organism as a whole and threaten to disrupt the co-ordinated complex of interlocking cell communities.

Forest edges are of particular interest, for they can be relatively stable or unstable and act as transition zones or end abruptly. Audy (personal communication) calls forest edges "fringe habitats" and the distinctive communities they contain "fringe communities"; such communities often contain species which are absent or very rare in adjacent regions. Important fringe species are *Aëdes simpsoni*, the vector of yellow fever in forest edges in Uganda, and a species of *Chrysops* which transmits loa loa on the west coast of Africa. Transition zones, whether stable or not, are important meeting-places for animals and arthropods, and an interchange of parasites is very likely to occur. Perhaps in East Africa the two cycles of yellow fever are or were linked in such a zone.

Relatively stable habitats like huts, caves, animal burrows, and termite hills, near or in which zoonoses can be transferred to man, are known to ecologists as "habitat niches"; they are sanctuaries protecting certain species from a potentially hostile environment. Forest edges, other transition zones, and forest canopies, though sometimes unstable, may be relatively stable; they then have more in common with habitat niches than ecotones. It is, of course, sometimes difficult to decide whether a particular area is unstable or not, and the foregoing remarks are tentative only.

The suggestion has been made that in Kenya and India the permanent foci of sylvatic plague are more likely to be found on relatively stable foothills than in plains rendered unstable by cultivation. The idea may have a wider application, and perhaps organisms causing zoonoses and other parasites can become firmly established in nature only if part of their life history is spent in an animal or animals living in a relatively stable environment. This view at present is somewhat speculative.

### Food-chains and Cycles

A study of what ecologists call "food-chains" and "food-cycles" is an important aspect of the synecology of the zoonoses. Animals linked by food form food-chains, and all the food-chains in a community form the food-cycle. In an animal community herbivores are preyed on by carnivores, which in turn are preyed on by larger carnivores, until an animal is reached which virtually has no enemies. The animals at the base of the chain are smaller and more numerous than those at the top. Elton (1927) has called this the pyramid of numbers.

Elton has suggested that parasites are really small carnivores, though they often do not kill their prey. The large components of parasite food-chains get smaller instead of larger, and more numerous instead of fewer; in fact, the pyramid of numbers is inverted. A study of the food-cycle and plague at Rongai shows that various ectoparasitic fleas pick up *P. pestis* from several rodent hosts. Plague bacilli develop rapidly in these fleas and are transmitted to man. Eventually the plague bacilli in the fleas may be attacked and destroyed by even smaller and more numerous organisms known as bacteriophages.

The importance of food-cycle studies has been stressed by Elton, who wrote: "Since the food cycle is so important in determining many of the possible modes of transference of parasites from one host to another, it is plain that biological surveys carried out along food-cycle lines would be of great value in narrowing the field of inquiry when the life history of any particular parasite is being studied." The value of food-cycle studies, particularly in relation to the food preferences of various disease-transmitting arthropods, is now fully appreciated. Dr. Weitz, at the Lister Institute, under the inspiration of the late Professor Buxton, has formed a most valuable unit, which devotes much time to the identification of arthropod blood meals from all over the world.

### Animal Communities

Most animals fluctuate greatly in numbers, and this must be taken into account when studying the zoonoses. At Rongai outbreaks of plague usually coincide with a remarkable increase in the wild rodents; when their numbers drop, which often happens quite suddenly, the link with the domestic rats (*Rattus* sp.) is temporarily broken and human infections cease for the time being. Plague and the regulation of numbers in wild animals has been discussed by Elton (1925), but the effect on resistant animals is not mentioned. In Kenya epizootic plague decimates the highly susceptible domestic rat, but several species of wild rodent are scarcely affected; they are, however, susceptible to other infections, and at times parts of the Rift Valley have been littered with wild rodent corpses. The periodic reduction of numbers in vertebrates is often caused by disease.

Other rodents as well as *Rattus* are highly susceptible to plague in other parts of the world, examples already given being ground squirrels in California and lobengula gerbils in South Africa. Periodically, these species are almost wiped out by plague in certain areas, and it may take as long as five years for their numbers to build up again; this affects the incidence of human infections. In South Africa the periodic fluctuation of rodent populations has been extensively studied by Davies.

Another important matter, which can only just be mentioned here, is the range or distribution of various species in nature. Animal hosts and arthropod vectors are dependent on their environment, and the occurrence of zoonoses in definite areas is essentially a zoogeographical problem.

### Conclusion

Although the importance of a synecological or holistic approach is stressed, it would be a mistake to take this too literally. Ecological processes are so complicated that there is a danger of getting involved in a mass of irrelevant ecological detail, and of forgetting that when studying a zoonosis the natural history of the causative organism is our chief concern. The infecting organism is in fact the pivot round which the ecological investigation revolves.

If the views expressed here have any validity, they probably apply not only to the zoonoses but to parasitic infections in general.

### Summary

The zoonoses, which are defined as *infections of man naturally acquired from other vertebrates*, are treated as a problem in ecology. This entails studying the interrelation between man, animals, a causative organism, the environment, and sometimes arthropods. Such an approach is holistic or synecological—wholes being regarded as more important than parts. Holism is a dynamic not a static conception.

The evolution of the zoonoses is discussed, particularly in relation to plague, relapsing fever, and leishmaniasis. The most important reservoirs of zoonoses and other parasitic infections are usually resistant or relatively insusceptible animals rather than highly susceptible ones. Plague and Chagas's disease illustrate this. Resistant and unduly susceptible animals occupy different "niches" in nature. By "niche" is meant the place of an animal in its biotic environment. Zoonoses often have a "focal distribution" in nature. Thus wild rodents infected with plague may occur in "pockets," and the vector mites of scrub typhus congregate in "typhus islands."

An unstable environment often favours the transference of zoonoses to man and animals. Examples are the plague-infected plain of Rongai, in Kenya, the typhus-infected forest clearings in Malaya, and the yellow-fever infected forest edges in Uganda. Ecologically unstable areas are termed "ecotones." Zoonoses can also be transmitted in or near relatively stable sites such as huts, rodent burrows, caves, and termite hills. These are known as "habitat niches." Animals and arthropods in a community are linked by food, and the importance of what are known as "food chains" and "food cycles" is discussed in relation to the transference of zoonotic infections from one host to another.

Reference is also made to the fluctuations in numbers of various animals in nature, and how this affects the incidence of zoonotic disease. Certain highly susceptible rodents are periodically decimated by plague; this breaks the link with man, and human infections cease for the time being.

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# CHEMICAL AND CLINICAL PROBLEMS OF THE ADRENAL CORTEX*

BY

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## Some Factors Governing the Response to Corticotrophin

### Growth Hormone

In 1951 Stack-Dunne and Young stated that they were able to obtain preparations from the anterior pituitary having two distinct kinds of activity. These separate preparations produced either a fall in the adrenal ascorbic-acid content or an increase in adrenal weight. They used growth hormone as a source of the adrenal weight factor, but did not consider that this factor was necessarily growth hormone itself. There seemed to be clinical data supporting the view at the same time, for at the same meeting to which Stack-Dunne and Young gave their paper we presented our early data on discrepancies between human response and the assay potency as determined by the Sayers method. However, as we have seen, this seems to have been explained on grounds of destruction or inactivation of the corticotrophin in the patients receiving it. The substance promoting adrenal weight and associated with, but not necessarily identical with, growth hormone also causes increased mitotic activity in the adrenal cortex and differs from the ascorbic-acid-depleting substance which is probably responsible for release and synthesis of corticosteroids (Cater and Stack-Dunne, 1955).

Forsham *et al.* (1955) summarized some experiments using a substance prepared by Rinfret from pig pituitary which was not itself steroidogenic but which, when given to a patient subsequently given corticotrophin, augmented the urine steroid response measured by the Porter–Silber method. A commercial growth-hormone preparation did not have a similar effect. We were fortunate enough to have at our disposal a small quantity of one of Young's growth-hormone preparations which he thought would be active with respect to the adrenal weight factor, although it had not been specifically tested for this activity. This substance was administered to a patient with Simmonds's disease whose adrenal had already been and continued to be stimulated with corticotrophin. We judged that in these circumstances the patient would also be deficient in growth hormone or the adrenal weight factor, and would be quite sensitive to it. There was a rapid increase in blood-sugar level, presumably due to the growth hormone itself, given intramuscularly 25 mg. twice daily for five days, but no increase in the ketogenic steroid or ketosteroid excretion. This negative result cannot be construed to be entirely contradictory to the hypothesis presented. It may well be that too little material was given for too short a time, or, as we shall see, that the absence of some other factor was limiting the response.

There is a clinical example before us worthy of attention with regard to this matter—namely, acromegaly. It is a commonplace that the adrenal cortices of patients with acromegaly are large and often contain subcapsular nodules. There is no unanimity of opinion about their

*Conclusion of the Humphry Davy Rolleston Lectures delivered at the Royal College of Physicians of London on May 15 and 17. The first part was published last week.

steroid production, but this might be expected to be low if the acidophil tumour caused sufficient reduction of anterior pituitary tissue. Adrenocortical insufficiency appears to be rare in acromegaly (Rummell, Baer, Hollister, and Kolb, 1951). In six patients with acromegaly the ketosteroid excretion was normal in three and low in three (Fraser *et al.*, 1941). In another group, three women and three men had high normal values, whilst one male with very prolonged disease had low values (Prunty, 1944).

Three cases have recently been studied. The first was a Polish grave-digger aged 36 with gross acromegaly. He excreted up to 22.5 mg. of ketosteroid daily and 18.4 mg. of ketogenic steroid. The second case was that of a man aged 43 who for five years had acromegaly with diabetes. He excreted up to 17.9 mg. of ketosteroid daily and 17.8 mg. of ketogenic steroids. The third patient was a woman aged 39 who 15 years previously had had an acidophil adenoma removed for eye signs. She had lately become very hirsute, with severe acne and pubic hair of male type. She excreted up to 34 mg. of ketosteroid and 12 mg. of ketogenic steroids daily. The last two patients were given corticotrophin according to the standard test. This was unfortunately of poor potency and had given apparently subnormal responses in several patients (see Table II). It had been used, however, in a patient with Cushing's syndrome due to hyperplasia of the adrenal cortex, with strongly positive results (S. E., Fig. 17). Such patients have a high sensitivity to corticotrophin. The two acromegalics gave a ketogenic steroid response which was low normal. The first acromegalic received a known potent batch of corticotrophin (89754) and did not show a brisk response. Clinically all these patients could be regarded as being in the active stage of the disease; although they presumably secreted excessive amounts of growth hormone, it does not follow that they did likewise with some other adrenal-cortical-activating agent. The results merely suggest that growth hormone itself did not appear to be a potent potentiating substance under these conditions of study.

#### Gonadotrophins

A second substance which has been implicated in having a subordinate effect on the adrenal cortex is the luteinizing hormone. Albright, Smith, and Fraser (1942) advanced complex arguments, based on the clinical relation between ovarian function and adrenal cortical function, that luteinizing hormone exerted an effect on ketosteroid secretion by the adrenal. Experiments based upon the suppression of ketosteroid excretion, which were thought to cause a simultaneous depression of luteinizing hormone and adrenal secretion of ketosteroid, seemed to support this hypothesis (Reifenstein, Forbes, Albright, Donaldson, and Carroll, 1945). We have conducted several experiments using preparations of luteinizing hormone ("pregnyl"; chorionic gonadotrophin) and follicle-stimulating hormone ("gestyl," prepared from pregnant mare's serum; serum gonadotrophin). The first of these was tried in the patient with Simmonds's disease who failed to show an effect with the growth-hormone preparation. No significant changes occurred when, in addition to corticotrophin, 1,000 units of gestyl was given daily for 10 days and on the fifth day 1,000 units of pregnyl daily was started for 10 days. This was in spite of the fact that a small menstrual period occurred, the first for many years.

In a second experiment a seemingly positive result was obtained. A patient with Hodgkin's disease was under successful treatment with corticotrophin; on 20 "clinical units" daily he excreted 34 mg. of ketogenic steroid and 24 mg. of ketosteroid. The addition of 3,000 units of pregnyl daily (chorionic gonadotrophin) caused, on the fifth and sixth days, a rise in ketogenic steroids to 60 mg. and ketosteroids to 33 mg. There was a prompt fall in the steroid levels after withdrawing gestyl.

A third experiment with pregnyl in a patient with rheumatoid arthritis treated with corticotrophin was negative. Two other experiments have also been made with gestyl (from pregnant mare's serum) with negative results; if anything there was a fall in the ketogenic steroid excretion.

These results are difficult to interpret, and, even if the positive finding can be repeated, it should be noted that both ketogenic steroids and ketosteroids responded to chorionic gonadotrophin, which does not correspond with the theory of Albright. There remains little doubt that there is a complex reciprocal relation between the adrenal cortex and the gonads (Parkes, 1945), and studies in animals suggest that the ovaries may sometimes even replace the adrenal cortex (Hill, 1948). In guinea-pigs gonadotrophin has been found to suppress the response of the adrenal to corticotrophin, using the excretion of ketogenic steroids as a criterion (Clayton and Hammant, 1955b).

### Effect of Tri-iodothyronine on Response to Corticotrophin

It has been thought for many years that there is an interdependence of the thyroid and adrenal cortex (Marine, 1930). Claims have been made that cortisone and corticotrophin reduce thyroid function (Hill, Reiss, Forsham, and Thorn, 1950; Wolfson, Beierwaltes, Robinson, Duff, Jones, Knorpp, Siemienski, and Eya, 1951; Lerman, 1955a). In the rabbit, radioactive iodine release by the thyroid is retarded by cortisone (Harris, 1955a). The low ketosteroid excretion in myxoedema has been found to rise when replacement therapy is given (Beierwaltes and Bishop, 1954; Lerman, 1955b). In our experience thyroid therapy has been required to produce significant clinical change in patients with myxoedema secondary to anterior hypopituitarism.

We have been able to conduct a single observation on the effect of tri-iodothyronine on the activity of the adrenal cortex. The same patient with Simmonds's disease was again under treatment with corticotrophin (Fig. 6), and tri-iodothyronine was given intravenously in a single dose of 0.5 mg. and two days later 0.25 mg. was injected. The typical effects of tri-iodothyronine are shown on the B.M.R. and the serum creatine and blood cholesterol levels. After an interval of two days the urine steroids and plasma hydrocortisone levels rose significantly. There were also effects on the level of blood sugar and on sodium retention. It can be concluded from this experiment that conditions exist in which increased thyroid activity can increase adrenal cortical secretion. The likely interpretation seems to be that when a near maximal stimulus by corticotrophin was applied the response was limited by a degree of hypothyroidism, the correction of which produced a good normal response. This effect might not so easily occur in patients treated for myxoedema, since in this situation, although thyroid hormone is raised to adequate levels for response of the adrenal cortex, the rate of endogenous secretion of corticotrophin could be the limiting factor.

### Development of Resistance to Corticotrophin

Earlier, when inactivation in muscle or subcutaneous tissue was a common problem, the development of resistance to continued injection also occurred (Forsham, Renold, and Frawley, 1951). It has already been indicated how variable

the response of patients can be to different doses and batches of corticotrophin, and for this reason some direct measurement of corticotrophin activity seems essential before in clinical practice the conclusion is drawn that a patient does not show a symptomatic response to treatment.

This point has been stressed by West (1954) and is illustrated by J. J., a woman under treatment with corticotrophin for rheumatoid arthritis (Fig. 7). After a prolonged period of therapy she no longer responded well clinically. It was known that the batch of corticotrophin in use on day 88 was not very effective in other individuals, so it was changed to a known very potent one (89754) at the same dosage (10 "clinical units" twice daily). As the response at day 109 was poor we repeated the identical batch and dose given at the beginning—that is, corticotrophin (89754) in doses of 20 "clinical units" twice daily. The patient responded again, but to a smaller degree. Nevertheless the intravenous administration of 40 "clinical units" of the same material on day 118 produced a large response, the excretion rate reaching 6.1 mg. per hour. It must be concluded that this patient developed a partial degree of unresponsiveness which could easily be overcome with sufficient stimulus. This experience demonstrates another reason for avoiding assumptions about the dose–response relationship to corticotrophin. West (1956) has also observed under certain conditions a failure of adrenal response to long-acting corticotrophin which is capable of being overcome.

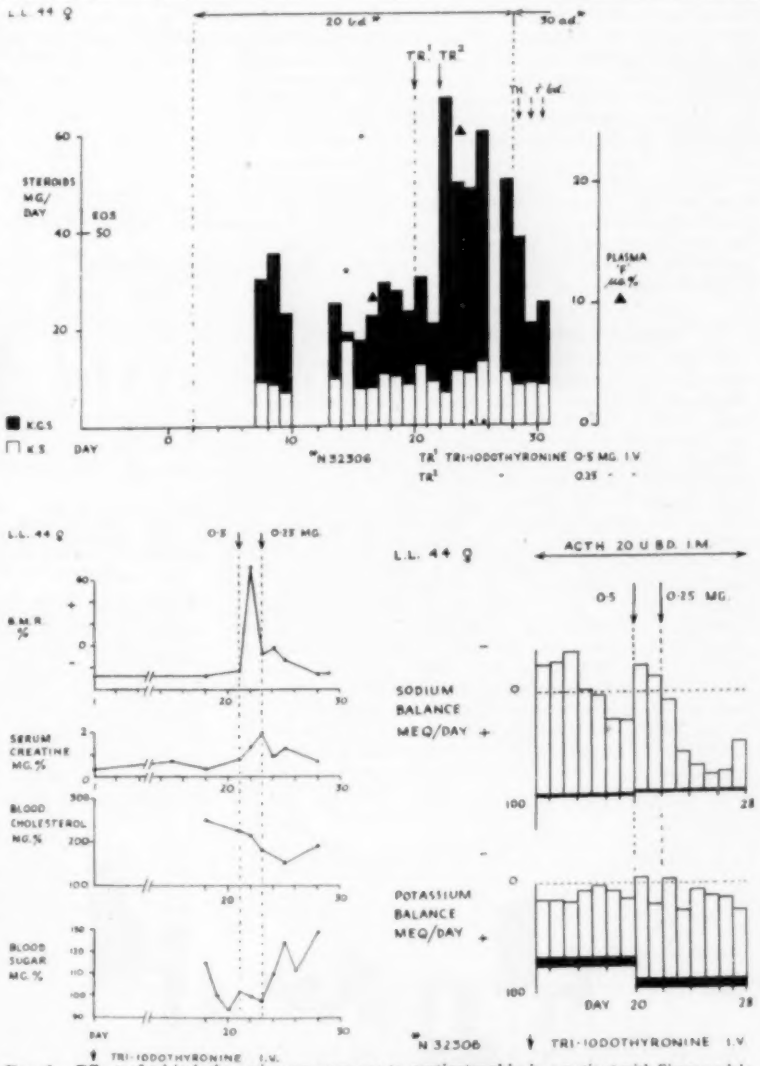



FIG. 6.—Effect of tri-iodothyronine on response to corticotrophin in a patient with Simmonds's disease. Tri-iodothyronine, two doses, was given intravenously. Eosinophils marked ●; plasma hydrocortisone ▲.

## Responses to Operation

The first observations on the effect of trauma in man on adrenal cortical secretion were made by Venning (1945), who found by bioassay an elevation of cortin levels of urine extracts under these conditions. For this and other reasons it may be supposed that operative intervention is a good method of investigating a patient's response to endogenous corticotrophin and possibly of studying quantitative differences in the response from those obtained with exogenous corticotrophin. Post-operatively, the general pattern of events seems to be that there is often a short initial increase of ketosteroids, sometimes followed by a fall for several days (Forbes, Donaldson, Reifenstein, and Albright, 1947; Prunty, 1953). When the Porter–Silber method was used the corticoid metabolites were found to

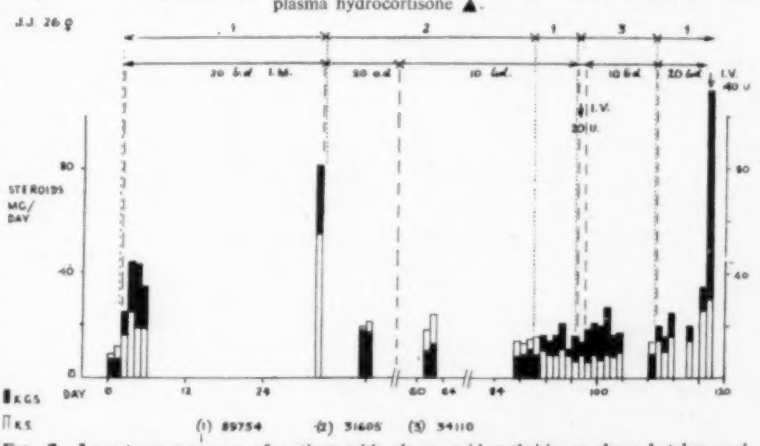



FIG. 7.—Long-term response of patient with rheumatoid arthritis to three batches and varying doses of intramuscular corticotrophin (except where marked, i.v.). The numbers on the top line, above the dosages, refer to different batches of corticotrophin.

increase early after operation and to persist for several days, depending on the amount of trauma (Moore, Steenburg, Ball, Wilson, and Myrden, 1955); this also occurs after burns (Wilson, Lovelace, and Hardy, 1955). With the method for ketogenic steroids the response is similar (Fig. 8). This has also been found by Jepson, Jordan, and Levell (1956). The magnitude of the response varies in different patients, but there is a tendency for the corticoid metabolites to increase to a greater extent than the ketosteroids. When methods of blood analysis for corticoids were used a sharp rise was also found immediately after operation, which may to a small extent be enhanced by temporary inability of the liver to metabolize the hormones as rapidly as normally (Sandberg, Eik-Nes, Samuels, and Tyler, 1954).

### Adrenal Cortical Virilism and Hirsutism

In 1933 Broster and Vines classified patients with the adrenogenital syndrome into those occurring before puberty and those after puberty. The rise in urine ketosteroids is a much more pronounced feature in the former group, and the ketosteroid levels in these patients are often very high after the adrenarche at puberty (Mason and Engstrom, 1950). In the latter group ketosteroids may apparently be normal, high normal, or just above normal, which is seen to be the case in the group of patients described below. Recently Patterson has found that the pre-pubertal group is divisible into two subgroups according to a high or low level of dehydroepiandrosterone excretion (Broster, Patterson, and Camber, 1953). There seems to be no obvious clinical significance of this finding at the present time. It has been observed that even patients with virilizing adrenocortical tumours, who sometimes have high excretion rates of dehydroepiandrosterone, need not necessarily excrete large amounts of this substance (Mason and Engstrom, 1950; Prunty, 1950). Its excretion will depend on its further conversion by the adrenal and rate of metabolism after secretion.

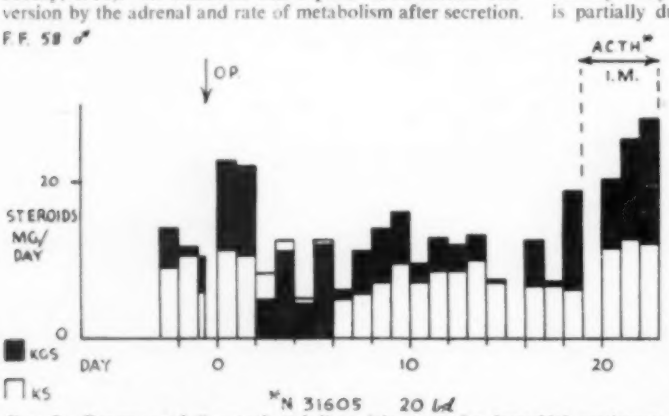



FIG. 8.—Response of "normal male" to lobectomy for bronchial carcinoma. Subsequently he responded normally to a poorly potent batch of corticotrophin.

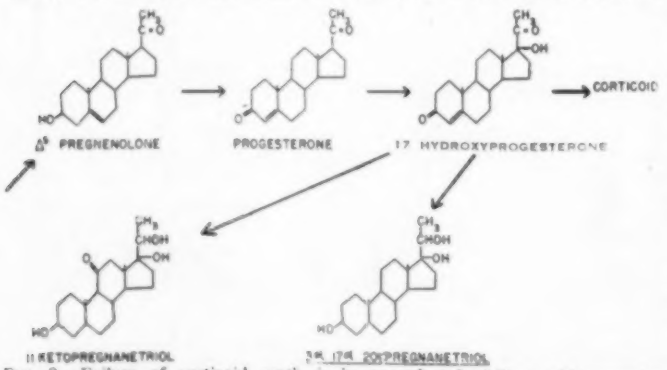



FIG. 9.—Failure of corticoid synthesis in pre-pubertal virilism with excessive excretion of pregnanetriol and 11-ketopregnanetriol.

The greatest biochemical advances in the field of the pre-pubertal syndrome have been made by Wilkins and his associates, particularly Bongiovanni (Wilkins, Bongiovanni, Clayton, Grumbach, and van Wyk, 1955). Bartter, Albright,

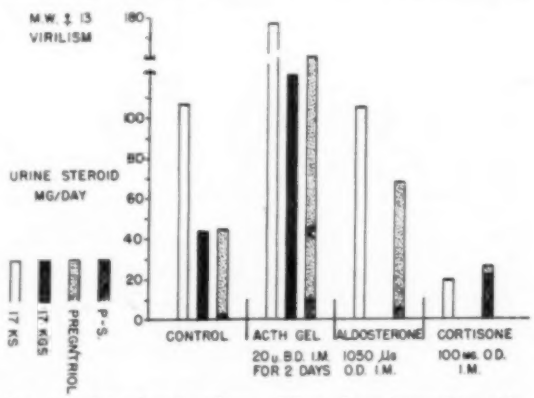



FIG. 10.—Pre-pubertal virilism. Effect of corticotrophin, aldosterone, and cortisone. Note the determination of ketogenic steroids includes pregnanetriol, therefore corticoid metabolites measured by Reddy method (P-S.). The latter rises on cortisone therapy due to metabolites derived from it.

Forbes, Leaf, Dempsey, and Carroll (1951) were the first to suggest that there is basically a deficiency in adrenal corticoid synthesis in this condition, and this would theoretically lead to an increased circulation of corticotrophin. The latter has been demonstrated by Morris (1952) and by Sydnor, Kelley, Raile, Ely, and Sayers (1953). The deficiency in synthesis of hydrocortisone and other corticoids is partially due to failure of introduction of the hydroxyl group at position 21 (Dorfman, 1955). A high proportion of ketosteroid is often found with hydroxylation at position 11. Bongiovanni has also found that pregnanetriol is excreted in the urine in large amounts which, it seems likely, originate from 17-hydroxyprogesterone, as also probably does the increased excretion of 11-ketopregnanetriol reported by Finkelstein, von Euw, and Reichstein (1953) (Fig. 9). It is thought that the high secretion rate of corticotrophin stimulates the secretion of excessive adrenal androgen, a raised blood level of which, unlike that of hydrocortisone, does not inhibit further corticotrophin release.

These patients vary in their response to exogenous corticotrophin, but the response shown in Fig. 10 is typical. The corticoid metabolites have here been estimated by a modification of the method of Reddy *et al.* (1952) and show very little response to corticotrophin, whereas there is a distinct rise in ketosteroids from already excessively high levels. The urine of this patient also contained greatly increased amounts of pregnanetriol, the excretion of which was further raised by corticotrophin. The estimation of pregnanetriol is relatively simple and has appeared to be quite specific in this syndrome. It is, however, also included in the steroids estimated by the method of Norymberski *et al.* (1953), giving falsely high values for the level of corticoid metabolites. Wilkins and his group have observed a large series of these cases, and have found that cortisone, as suggested by Bartter *et al.* (1951) and especially if used early enough, has dramatic effects in alleviating the abnormalities. It also has a very powerful effect, as would be expected, on reducing

TABLE III.—*Steroid Excretion and Response to Corticotrophin—Adult Hirsutism*

| Patient | Age | Summary | Resting (mg./day) | | Response to Corticotrophin | |
|---|---|---|---|---|---|---|
| | | | Ketosteroid | Ketogenic Steroid | Max. Ketogenic Steroids (mg./day) | K.G.S./K.S. Ratio |
| 1 F. S. | 37 | 10 years' severe hirsutism accompanied by post-encephalitic changes from illness at age 7 .. .. .. .. | 20–27 | 10·4–13·1 | 27 | 0·3 |
| 2 L. C. | 22 | Hirsutism at puberty. Menorrhagia. Pseudomucinous cystadenoma removed at age 17, with one ovary. Histology of other ovary normal at 22. Other ovary had to be removed with uterus for menorrhagia. Urine oestrogen 13 µg./day after this .. .. .. .. .. .. | 11·7–14·3 | 3·7–4·1 | 36 | 0·8 |
| 3 S. J. | 28 | Hirsute at 21 .. .. .. .. .. .. | 20–25 | 2·8–11·8 | 44 | 0·9 |
| 4 Z. C. | 30 | Hirsute at puberty. Virilized. Homosexual. Normal ovarian histology. Improved after subtotal adrenalectomy | 10–12 (1·4–5·5 post-op.) | 6·7–10·3 | 30 | 1·1 |
| 5 S. B. | 21 | Hirsute at 16. Severe. Normal E.U.A. .. .. .. | 18–19 | 12·2–14·9 | 60 | 1·1 |
| 6 O. F. | 25 | Overweight and hirsute from after puberty. Severe acne .. | 15–22 | 15·4–20·1 | 74 | 1·5 |
| 7 K. P. | 26 | Overweight 10 years, severely hirsute 4 years. Few purple striae. E.U.A. normal .. .. .. .. .. | 17–20 | 12·4–15·4 | 50 | 1·2 |
| 8 M. L. | 29 | Severe hirsutism from puberty. E.U.A. normal .. .. | 9–12 | 13·2–17·7 | 67 | 1·9 |
| 9 J. B. | 30 | 2 years' severe facial hirsutism. A mild case .. .. | 17–25 | 9·3–9·7 | 75 | 1·4 |

E.U.A. refers to examination of genital tract under anaesthesia.

the level of the ketosteroid output, and control of the dosage in this way is essential. It similarly depresses the excretion of pregnanetriol.

### Post-pubertal Hirsutism

Patients suffering from post-pubertal hirsutism have been the subject of less fruitful research, and indeed are often grouped together under the term "idiopathic hirsutism." There is a striking incidence of the beginning of the disturbance at or soon after puberty, which is at a time when the adrenal cortex has assumed its adult pattern of secretion, especially with regard to ketosteroids (Mason and Engstrom, 1950). It is perhaps odd that they develop the degree of hirsutism that they often do, with little or no increase in their resting ketosteroid excretion. It has been shown that under conditions of increased stimulation with corticotrophin they are then capable of excreting amounts of ketosteroids relatively in excess of the normal. A group of nine patients have been studied.

The basal steroid levels in the urine and the data of response to corticotrophin for these patients are summarized in Table III. There is a general tendency for the ratio of ketogenic steroids to ketosteroids to correlate with their clinical state, Case 1 being the most severe and Case 9 the mildest. There seems to be little relation between this ratio and the basal ketosteroid levels. Dr. Brooks, in our laboratory, has kindly carried out more detailed investigations of the ketosteroid patterns in three of the worst of these patients, using methods he has been developing for this purpose (Brooks, 1956). The β-ketosteroids represent largely dehydroepiandrosterone (Table IV). One of the most virilized individuals (Case 4) showed the highest basal level and, like Case 2, responded well to corticotrophin. The excretion of this substance in Case 1 was poor. The fraction of polar ketosteroids is particularly important, as it represents the ketosteroids with 11-ketone or hydroxyl groups. That they do not form a large proportion of the ketosteroid excretion after stimulation with corticotrophin would therefore indicate that the larger part of the ketosteroids is not primarily derived indirectly as corticoid metabolites, but almost certainly by increased ketosteroid synthesis by the gland. The highest proportion of the total ketosteroid as polar ketosteroid after corticotrophin (19%) was found in Case 1. This was appreciably less than in the patient studied with prepubertal adrenogenital syndrome, whose corresponding figure was 31%. The comparison is similar in the case of the resting levels of the polar fraction.

TABLE IV.—*Ketosteroid Fractionation in Adult Hirsutism*

| Case | | Total Ketosteroid (mg./day) | β-Fraction (mg./day) | Polar Ketosteroids (mg./day) |
|---|---|---|---|---|
| 1 | Resting .. .. .. | 20·4 | 0·9 | 2·7 |
| | Corticotrophin .. .. | 49·2 | 2·4 | 8·1 |
| 2 | Resting .. .. .. | 14·3 | 2·6 | |
| | Corticotrophin .. .. | 41·3 | 13·7 | 6·5 |
| 4 | Resting .. .. .. | 12·1 | 5·6 | 1·2 |
| | Corticotrophin .. .. | 27·6 | 11·4 | 4·0 |
| Rheumatoid arthritis | Resting .. .. | 11·4 | 2·9 | <0·1 |
| | Corticotrophin.. | 18·5 | 4·0 | 3·7 |
| Prepubertal adrenogenital syndrome | Resting .. | 107 | 12·1 | 33·6 |
| | Corticotrophin | 182 | 19·1 | 56·6 |

TABLE V.—*Pregnanetriol in Urine*

| | Before Corticotrophin (mg./day) | After Corticotrophin (mg./day) |
|---|---|---|
| Case 1. Hirsutism .. .. | 1·5 | 8·2 (4)* |
| ,, 2. ,, .. .. | 1·1 | 6·0 (4) |
| ,, 4. ,, .. .. | 1·2 | 1·6 (4) |
| ,, 5. ,, .. .. | 1·3 | 4·5 (3) |
| ,, 8. ,, .. .. | 1·1 | 7·6 (4) |
| Adrenogenital syndrome (F) .. | 45·0 | 124·0 (3) |
| Rheumatoid arthritis (F) .. | 1·9 | 2·3 (3) |
| ,, ,, (F) .. | 0·2 | 4·6 (3) |
| Sub. nephritis (F) .. .. | 0·2 | 3·0 (4) |
| Hodgkin's disease (M) .. .. | — | 2·0 (—) |
| Cushing's syndrome (M) .. | 2·8 | 2·7/8 hours* |

Figure in parentheses is day of corticotrophin administration.
* Equivalent to approximately 8 mg./24 hours.

TABLE VI.—*Comparison of Steroid Responses in Patients with Normal Adrenals and Those with Adult Hirsutism or Prepubertal Adrenogenital Syndrome*

| | Normal | Hirsutism | Adrenogenital Syndrome |
|---|---|---|---|
| Resting corticoid metabolites | Normal | Normal | Normal or low |
| ,, ketosteroids .. | ,, | Normal to high | High to very high |
| ,, 11-oxyketosteroids | ,, | Normal | Often high |
| ,, β-ketosteroids .. | ,, | Normal or high | Sometimes high |
| ,, pregnanetriol .. | ,, | Normal | High |
| Corticoid metabolites response to corticotrophin | Good | Good | Poor |
| Corticoid metabolites ketosteroid response to corticotrophin .. .. | High | Low | Very low |

The excretion of pregnanetriol in these patients is not very different from that found in other individuals (Table V), even after stimulation with corticotrophin. The highest level reached is that in Case 1, which is similar in magnitude to that in the patient with Cushing's syndrome. It cannot therefore be inferred that there is an abnormality in pregnanetriol excretion comparable to that in the pre-pubertal adrenogenital syndrome. Comparison of the hirsute group with normal individuals and the findings in the adrenogenital syndrome are summarized in Table VI.

### Time of Adrenarche

It is clear that the inhibition of synthesis of adrenal corticoid, characteristic of the adrenogenital group, is not present in the hirsute group, although they are inclined to excrete more ketosteroid than normal, especially when given corticotrophin. In the same way that the adrenogenital cases excrete more β-ketosteroid, so sometimes do the hirsute ones. The basis of the abnormality of the hirsute patients is still not clear, but a tentative hypothesis may be put forward. One patient in our series, not included among those mentioned, developed hirsutism at the age of 8 and puberty at 13. Yet in adult life she had normal ketosteroid excretion. It is suggested that she had an early adrenarche as mentioned by Talbot, Sobel, McArthur, and Crawford (1952), but which is poorly documented.

We think also that we have encountered an example of the reverse condition of delayed adrenarche in a boy who did not develop puberty until the age of 18, when F.S.H. became detectable in the urine and ketosteroids were still only 4.6 mg. per day. The response of ketosteroids to corticotrophin in particular was poor at the ages of 16 and 18. The latter was confirmed with intravenous corticotrophin. A maximal dose of 40 "clinical units" intravenously was sufficient to stimulate the adrenal more normally. The fact that in younger normal children and in this boy ketosteroids do not rise to adult levels with corticotrophin suggests that there is some factor operating, either in the adrenal cortex or possibly an additional stimulating factor, which brings about the normal pattern after the adrenarche. This factor does not appear to be chorionic gonadotrophin, as suggested by Albright. It would therefore appear that the lesion in hirsute women may depend on an abnormality of the accessory factor which enables the adrenal to respond by secreting excessive quantities of normal ketosteroids. The probable presence of a hypothalamic lesion in Case 1 should be specially considered as a cause of such maladjustment. The relation of the hypothalamus to the adrenal cortex is further discussed.

Treatment with corticotrophin of a group of patients with anterior hypopituitarism over a period of years is reviewed more fully below. For the present it is sufficient to note that, although their responses were good in other respects, their ketosteroid levels were always on the low side of normal. It was not possible to obtain adequate hair growth with the corticotrophin alone; the men required testosterone, and in the women pubic and axillary hair remained below normal standards. This might indicate that in these patients a factor is lacking which enables the adrenal to secrete normal amounts of androgen. The question of the exact nature of the androgenic hormones from the adrenal cannot yet be regarded as entirely settled (Munson, Goetz, Laidlaw, Harrison, and Thorn, 1954; Kappas *et al.*, 1955).

### Failure of Cortisone Therapy in Hirsutism

The importance and value of the use of cortisone in suppression of excess ketosteroid secretion in the pre-pubertal adrenogenital syndrome has been mentioned. It seemed worth while to explore its value in hirsute women. The property of suppression of ketosteroids is not confined to patients with the pre-pubertal syndrome (Copeman, Savage, Bishop, Dodds, Kellie, Stewart, Glyn, Henly, and Tweed, 1952; Pond, 1955). We have treated five hirsute women with cortisone (Table VII). Doses of cortisone ranging from 37.5 to 125 mg. daily were given for periods from three months to three years. In none of these patients have there been any really satisfactory changes in the state of the hirsutism. This finding is, however, to be expected, since it has been pointed out by Wilkins *et al.* (1955) from their large experience that well-established hirsutism is slow and difficult to improve in the adrenogenital syndrome. This has also been our experience.

It is of great interest to note that Wilkins *et al.* (1955) reported that one of their adult patients had developed masculine baldness, and with cortisone treatment had a new growth of hair on the scalp. We encountered a dramatic and rapid growth of normally pigmented hair on the head in a completely bald woman of 44, who was under treatment for an eye lesion, with large doses of cortisone (375 mg. scaling down to 50 mg. daily). This event prompted its trial in a second patient. This latter had ovarian dysgenesis accompanied by complete baldness, which had been present for several years. Although she improved greatly in other respects, oestrogen therapy had no effect on the scalp until an addition was made of 100 mg. of cortisone daily. In the next three weeks it was possible to discern a definite growth, and several weeks later she had a satisfactory head of hair. The mechanism of this is of interest. The baldness in the second patient could hardly be ascribed to excess of adrenal ketosteroid, as it was in the patient of Wilkins *et al.* (1955).

TABLE VII.—*Excretion of Ketogenic Steroids and Ketosteroids After Administration of Cortisone*

| Case | Sex | Cortisone Acetate Dose* (mg. day) | Ketogenic Steroids (mg. day) | Ketosteroids (mg. day) |
|---|---|---|---|---|
| A Hypophysectomy; car. prostate | M | 25 | 6·8 (27%) | 4·3 |
| B Hirsute | F | 25 | 9·1 (36%) | 9·2 |
| C ,, (Case 4, Table I:I) after adrenalectomy | F | 37·5 | 14 (38%) | 3·6 |
| B Hirsute | F | 50 | 16–20 (32–40%) | 7 |
| D ,, (Case 5) | F | 50 | 22 (44%) | 10 |
| E Attempted hypophysectomy; car. breast | F | 50 | 25 (50%) | 6·5 |
| A Hypophysectomy; car. prostate | M | 50 | 27 (54%) | 8·0 |
| B Hirsute | F | 75 | 36 (48%) | 6 |
| F ,, (Case 3) | F | 100 | 22 (22%) | 6 |
| E Attempted hypophysectomy: car. breast | F | 100 i.m. | 52 (52%) | 5·5 |
| | | 100 | 35 (35%) | 5·6 |
| G Hirsute (Case 1) | F | 125 | 19–44 (15–35%) | 10–24 |
| H Lupus erythematosus | F | 250 | 93 (37%) | 9·7 |
| I Iridocyclitis | F | 375 | 133 (35%) | 65 |
| J Exfoliative dermatitis | M | 2,000 | 137–620 (7–31%) | 18–44 |

* Divided oral doses.

Several years ago we observed that oestrogen therapy had no effect on the excess ketosteroid excretion in a patient with pre-pubertal adrenogenital syndrome, and this has been found by others. On the other hand, after gonadectomy of a male pseudohermaphrodite there was some suppression of adrenal ketosteroid, but not of the dehydroepiandrosterone fraction (Prunty, 1953). We have administered oestrogen to two of our hirsute patients. In one of these, who was co-operative and obsessional about her condition, we were able to collect and weigh facial hair shavings. Both cortisone and ethinyloestradiol seemed to produce a small depression of ketosteroid excretion (from about 8 to 10 mg. per day to 6 mg. per day). The rate of hair growth, approximately 6.2 mg. daily on 50 mg. of cortisone daily for three weeks, was unchanged. Ethinyloestradiol for a period of up to 120 days was also without effect, in spite of the fact that the patient was quite convinced that it caused improvement. This presumably was due to an improvement in the texture of the skin. Hydrocortisone ointment applied locally also produced no result. On the other hand, the situation in the adrenogenital syndrome is probably somewhat different. A combination of cortisone with oestrogen (0.2 mg. of ethinyloestradiol daily for three in every four weeks) appears to be more effective than the use of larger doses of cortisone alone. Armstrong (1955) has published similar and more convincing evidence of this effect in three patients with this syndrome.

During the course of cortisone therapy we have made observations on the recovery of cortisone metabolites by the method of Norymberski *et al.* (1953) (Table VII). These authors concluded that a recovery of about 40% of the administered dose was obtained. Except when the cortisone dosage is high, the recovery figures are unreliable because of the unpredictable depression of the endogenous corticoid secretion. After subtotal adrenalectomy patient C excreted 4 mg. of ketogenic steroids daily, so that net cortisone recovery must have exceeded 27%. The average

recovery at dose levels above 37.5 mg. of cortisone daily is 40%. Nevertheless patient J, receiving 2,000 mg. of cortisone daily, excreted at times as little as 7% as ketogenic steroid. The ketosteroid figures show that significant amounts begin to appear at dose levels above 100 mg. daily. In patient J the highest ketosteroid level corresponded with the lowest ketogenic steroid level, and vice versa. The metabolism is therefore somewhat unpredictable. It is important to note that in the five hirsute patients in Table VII the ketosteroids were depressed by an average of about 30%. There was therefore no indication of an abnormal increase in ketosteroid excretion in these particular patients when cortisone was given. The fall in recovery after intramuscular as opposed to oral cortisone administration should be noted. This has also been observed during the course of treatment of a patient with the pre-pubertal adrenogenital syndrome. It is probably dependent on the slower rate at which the steroid is taken to the liver.

## Observations on a Group of Male Obese Patients

In Table VIII are listed seven obese male patients. Clinically these patients are divisible into at least two categories. Firstly, there are the two juveniles who respond to corticotrophin like the normal children. Secondly, the adults show a gradation in their behaviour. Patients D. C. and L. D. responded like a normal adult with respect to the excretion of ketogenic steroids. The others all gave poor ketogenic steroid responses to corticotrophin (Table II), in spite of the fact that they received the potent batch (89754) given to the hirsute women. In addition they show a gradation with respect to the ketogenic steroid:ketosteroid ratio, the extreme case giving a ratio as low as 0.6. This patient also responded to intravenous corticotrophin with a bigger increase in ketosteroids than ketogenic steroids. The intravenous test in R. C. showed a similar trend, whilst

TABLE VIII.—*Obese Male Patients*

| Patient | Age | Summary | Ketogenic Steroid (mg./day) | Ketosteroid (mg./day) | K.G.S./K.S. Ratio on Corticotrophin |
|---|---|---|---|---|---|
| R. P. | 12 | Always tended to be overweight. Plethoric obese lad with white striae on limbs. No hypertension .. .. | 7 | 7 | 2·7 |
| I. S. | 15 | 5 years' obesity. No signs of puberty .. | 7 | 3 | 5·1 |
| R. S. | 25 | Overweight since age 7. Plethoric. Obesity limbs and trunk. Reddish striae present. No hypertension .. | 16 | 23 | 0·6 |
| R. C. | 20 | 40 lb. (18·1 kg.) weight gain in 1 year. Slightly plethoric. Reddish abdominal striae. Mild hypertension and early diabetic sugar curve. Plasma hydrocortisone 6 µg./100 ml. .. .. | 13 | 13 | 1·1 |
| D. C. | 25 | Obese since age 10. Generalized obesity with reddish striae. Mildly feminine habitus. No hypertension. Plasma hydrocortisone 5 µg./100 ml. .. | 10 | 8 | 1·8 |
| L. D. | 24 | 3 stone (19 kg.) weight gain in 4 months. Polio, age 16. Plethoric and rounded face. Moderate reddish striae and acne. No hypertension. Very good response to restricted diet .. .. .. | 16 | 17 | 1·3 |
| P. H. | 22 | 5 stone (31·8 kg.) weight gain to 17½ stone (111 kg.) in 4 years. A few small striae (pale) with generalized obesity. No hypertension .. .. .. .. | 17 | 12 | 2·8 |

that in D. C. and L. D. was of a more normal pattern. It is to be noted that R. S. had the highest level of resting ketosteroids. The significance of these findings is not clear at the present time. The results show that there are conditions in the male when the ketogenic steroid:ketosteroid response to corticotrophin can resemble that in the abnormal women.

## Abnormal Responses to Operation

The normal findings in the response of steroid excretion to the trauma of operation have already been discussed. Amongst the hirsute women it was possible to study the response to hysterectomy (Case 2) and this is shown in Fig. 11. It will be recalled that this patient responded to corticotrophin with a higher ketosteroid excretion than ketogenic steroid excretion. The response to operation shows a similar trend, in general the rise in ketosteroids exceeding that of ketogenic steroids. The response of the adrenal therefore seems to depend upon endogenous conditions in the patient and not merely to the properties of the corticotrophin administered.

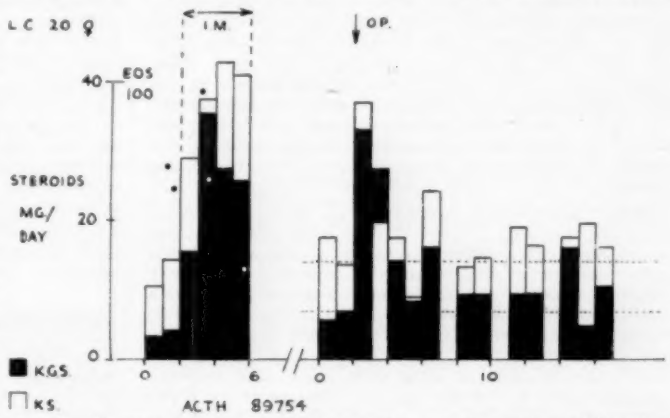



FIG. 11.—Response to operation (hysterectomy) in a patient with adult hirsutism (L. C., Case 2). Note before operation abnormal pattern of corticotrophin response (see text).

## Conditions Under Which Ketogenic Steroid Excretion Falls Below That of Ketosteroids After Adrenal Cortical Stimulation

The conditions which tend to cause reversal of the ketogenic steroid:ketosteroid ratio can now be summarized. This has been encountered in the following circumstances: (1) Adult hirsutism. (2) Certain adult obese males. (3) When the corticotrophin stimulus to the adrenal cortex is lessened—that is, when the response is diminishing. An example of this is seen in Fig. 7 at day 40. This presumably indicates that the rate of corticoid secretion falls off first. This tendency has also been observed during the "tail-off" period after intravenous corticotrophin. (4) With different batches of corticotrophin there appears to be a definite tendency with less potent batches of corticotrophin for the ratio to be lower than usual. The effect of a potent batch (89754) is strikingly seen in Fig. 7 at day 91, where there is sudden reversal in the ratio with a small upward trend of the ketogenic steroids.

Forsham *et al.* (1955) noted a difference in the ratio of corticoid metabolites to ketosteroids, particularly with different batches of corticotrophin. This finding indicates that caution must be used in the interpretation of variations in the ratio. It is the reason why comparisons have at present been restricted to those observations made with a known potent corticotrophin (89754) which has been shown to be particularly active in causing an increase in ketogenic steroid excretion rates. While these observations were being concluded, Laidlaw *et al.* (1955) published data similar to ours in adult virilized women. They took care to exclude ovarian pathology as a cause for the disturbance in their patients.

## Response of Patients With Hypopituitarism to Corticotrophin Therapy

No doubt largely because of the practical difficulty of administration, the long-term use of corticotrophin in

patients with anterior hypopituitarism is rarely reported. Furthermore, discouraging reports appeared suggesting that complications, such as severe water retention (Whittaker and Whitehead, 1954) or cerebral disturbances, occurred after short periods of administration (Summers and Sheehan, 1951). Robertson and Kirkpatrick (1951) treated a patient for 32 days without ill effect. The report of the longest use of corticotrophin is that of Aber, Chandler, and Hartfall (1954), who gave it to one patient for 160 days. They recommend that as little as 40 "clinical units" of gel, given once weekly as a maintenance dose, may be sufficient. The data presented below indicate almost surely that this is far too infrequent administration of the hormone, and would be likely to be dangerous in a severely affected patient.

Three patients with hypopituitarism have been treated with corticotrophin for two to three years. This enabled us to study the continued response of the adrenal and assess the amount of corticotrophin required in patients in whom it is virtually absent. The first patient (J. L.) was a man aged 28 with typical hypopituitarism and failure of puberty to develop owing to an apparent small chromophobe adenoma (Mills, 1955a). E. R. was a man aged 62 with typical features of about three years' duration, ketosteroids falling to 1.5 mg. per day. The aetiology of his condition has never been established. L. L. was a woman aged 44 with classical Simmonds's disease due to postpartum haemorrhage seventeen years previously. Each patient noticed pronounced subjective improvement on corticotrophin therapy, with weight gain and a feeling of vigour not experienced previously. The effects on the thyroid and hair growth have been discussed. There was reversal of abnormal water diuresis and insulin sensitivity tests.

The response to the hormone over the last twelve to fourteen months in these three patients is shown in Fig. 12. It will be seen that they are sensitive to dosage, one patient in particular (E. R.) giving excessively high ketogenic steroids on 20 "clinical units" of corticotrophin gel twice daily. On the whole, normal levels of ketogenic steroids were produced by doses of rather less than 20 "clinical units" of gel once daily. There were times when weight gain and fullness of the face became excessive, in spite of the fact that corticotrophin dosage was not otherwise thought to be too large. This, of course, particularly occurred in J. L. when his ketogenic steroids reached 37 mg. daily and in E. R. when they reached 84 mg. daily. But these signs sometimes occurred with ketogenic steroids in the neighbourhood of 20 mg. They suggested reduction of dosage. The effect of poor local absorption is seen in L. L., when for a time 25 "clinical units" daily gave only 1.5 mg. of ketogenic steroid in the urine. This may have been due to local infection at the injection site. The occurrence of a severe cold at another time in this patient did not have the same effect. This investigation showed, therefore, that it was possible to maintain adrenal cortical stimulation with corticotrophin for prolonged periods. It also gave valuable information concerning the quantity required to maintain normal levels of ketogenic steroids, but at the same time the ketosteroid excretion tended to be below normal.

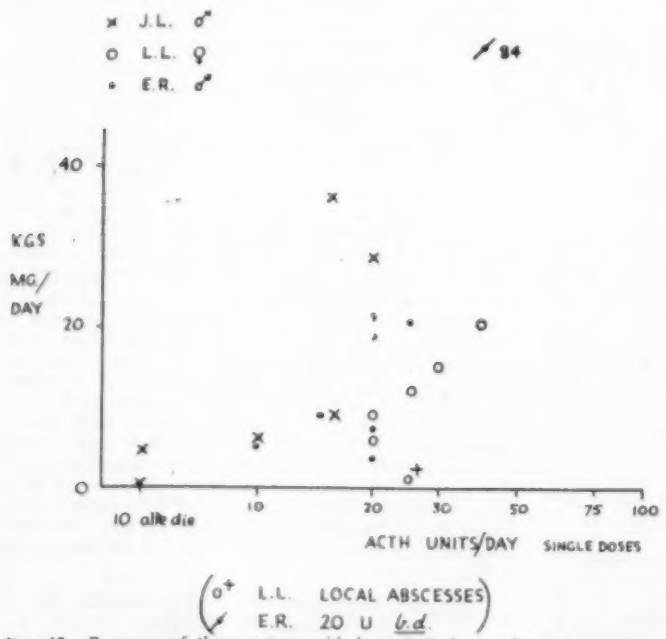



FIG. 12.—Response of three patients with hypopituitarism to long-term corticotrophin therapy (see text).

## Observations on Cerebral Disturbances in Anterior Hypopituitarism

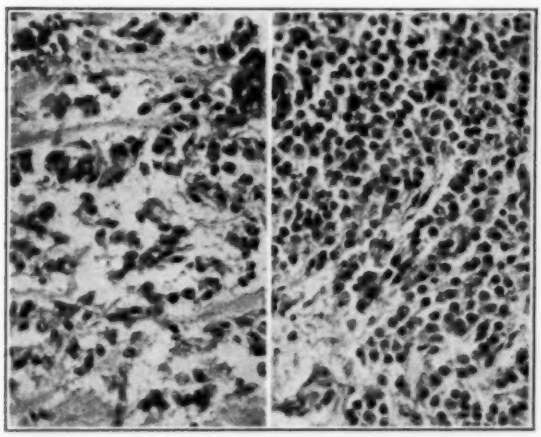
Anxiety to reduce the dosage of corticotrophin in J. L. ultimately led to a serious state of affairs.

This patient was treated for four months with 10 "clinical units" daily, together with a testosterone imp'ant and thyroid, and was clinically very well, having a ketogenic steroid level of 6.6 mg. daily. He had a very full facial appearance, and the dosage was further reduced to 10 "clinical units" on alternate days. After two months on this dosage his ketogenic steroids, during the day of injection, were 4.9 mg. per day. Shortly after he complained of left temporal headache, which became progressively worse and vomiting began. The nature of the headache, which was very persistent, suggested the possibility of an intracranial lesion. On admission for investigation his ketogenic steroids were only 0.3 mg. per day during the 24 hours after injection of corticotrophin. It seems most likely that this fall was due to inadequate dosage (compare Fig. 11) rather than to any resistance on the part of the adrenal to corticotrophin. He lay curled up in bed and was resistant to interference, with moderately frequent vomiting. He was put on cortisone, 75 mg. intramuscularly daily. At this time his blood pressure fell to 95/65 mm. Hg. Meanwhile investigations of the cerebral condition showed no change in the appearance of the sella turcica and all other investigations were normal. However, the E.E.G. had shown a pattern suggesting a right temporal focal lesion and, six weeks later, a pattern compatible with the presence of a craniopharyngioma. A month after starting cortisone he showed significant improvement and two weeks later had resumed his normal health. At this stage the E.E.G. had almost returned to normal.

A second patient with severe anterior hypopituitarism was a woman aged 54 who twenty-three years previously had developed amenorrhoea following apparently normal parturition. One day she complained of headache and feeling unwell and went to bed, where she lapsed into coma for thirty-six hours. She was admitted to hospital in a state of severe irritability and incontinent of urine and faeces. Tendon and abdominal reflexes were absent. Lumbar puncture was performed with extreme difficulty on account of her irritable condition, and the C.S.F. contained 70 mg. of protein and 6 leucocytes per c.mm. Blood pressure was 75/45 mm. Hg. After two days she responded to a glucose-saline drip. She had a second milder attack which responded to "eucortone," testosterone, and salt. A year later she was admitted in coma with convulsions and stertorous breathing. She had felt vaguely unwell, ate nothing for three days, and lapsed into coma. All tendon reflexes were difficult to elicit. The blood sugar was 45 mg. per 100 ml. In spite of treatment with dextrose and eucortone intravenously she died in two hours. There was a cyst 10 mm. in diameter in the pituitary fossa. No thyroid or adrenal tissue was found and both ovaries were small.

In a third instance of difficulty with a stuporous patient the findings were even more confusing.

A man aged 47 had had a chromophobe adenoma operated upon five years previously. After a period of good health he returned with malaise, depression, headache, and vomiting. Full neurological investigations were made, and it was considered that he had no recurrence of his pituitary lesion. He was transferred to us by Mr. Harvey Jackson for endocrinological investigation. He was somnolent and would answer only one sentence at a time. He regularly vomited in the early mornings. He had a small stubbly beard, small and soft testicles, and somewhat sparse axillary and pubic hair. Blood pressure was 120/75 mm. Hg. The fundi were normal. The insulin tolerance was normal. Ketosteroids were low, but response to corticotrophin was good. Excretion of radioactive iodine was 10.5% in twenty-four hours and 63% in forty-eight hours. The E.E.G. was abnormal, "consistent with a central space-occupying lesion or biochemical disturbance." It was decided to repeat ventriculography, but before this could be done the patient suddenly died. At necropsy a secondary carcinoma, by meningeal spread, 2 cm. in diameter, was found in the midline above the cerebellum (Fig. 13). This was causing



A B

FIG. 13.—Carcinoma of anterior pituitary. A. Malignant cells in remaining tissue in pituitary fossa after previous operation. B. Section through secondary neoplasm above cerebellum. Several small secondaries were also present on the meninges.

a moderate degree of internal hydrocephalus. The thyroid acini showed flattened epithelium, some atrophy of the adrenal cortical fasciculata had occurred, and there was a decrease in testicular interstitial cells, but spermatogenesis was active but reduced. It must be concluded that the patient had only a mild degree of hypopituitarism, and his symptoms were mostly due to internal hydrocephalus.

Metastasizing carcinoma of the pituitary is exceedingly rare, but has been found to spread by the meninges (Willis, 1952). Local infiltration by carcinomas of the pituitary gland is a rather more commonly recognized condition (King, 1951).

## Observations on Cerebral Disturbances in Addison's Disease

The problem of the differentiation of cerebral irritation due to organic cause as distinct from a metabolic one also arises in Addison's disease. I have observed this confusion in three instances, and am indebted to Dr. G. W. Thorn for permission to mention the first two of these.

The first was a man aged 31 who had developed severe Addison's disease nine years previously and who five years later also developed diabetes mellitus (see Thorn and Clinton, 1943). He was readmitted to hospital in a state of Addisonian crisis, on which supervened a diabetic crisis. He was treated for both conditions, but did not resume a normal mental state for five days. Most of the time he was comatose and apathetic, but during practically the whole of this period developed typical fits of Jacksonian epilepsy, starting unilaterally and sometimes becoming generalized. For several days they occurred with a frequency of about once hourly. The strong temptation to perform ventriculography was resisted. On satisfactory restoration to normal metabolic conditions the attacks completely disappeared. It was not possible to correlate these occurrences with any particular biochemical abnormality.

The second patient was a boy aged 12 who complained of recent headaches, drowsiness, and fainting spells. Nystagmus, a degree of neck rigidity, and varying tendon reflexes had been noted. The E.E.G. showed the typical slow-wave activity seen in Addison's disease but suggesting localization in the right frontal region. Trephine of the skull was carried out for exploratory purposes, and this operation precipitated an Addisonian crisis, from which he subsequently recovered.

The third example also concerned a child, a girl aged 10, who developed listlessness and dizzy spells. She complained of having had diplopia and blurred vision a month previously. She was found to have an ataxic gait. She lay curled up on her side, resisted interference, and was very irritable if roused. Questionable meningism was also occasionally present. In spite of the presence of developing pigmentation, the possibility of a posterior fossa neoplasm was considered. The E.E.G. showed high-voltage slow-wave activity and, it was thought, also suggested a posterior fossa lesion. She was not hypoglycaemic. It was nevertheless decided to treat her for Addison's disease, but within an hour before this was done she went into crisis from which she could not be rallied. There was complete atrophy of the adrenal cortex.

These examples of cerebral disturbance in hypopituitarism and Addison's disease draw further attention to a diagnostic problem. In Addison's disease some of the accompanying well-known mental changes were mentioned by Addison himself and later emphasized by Cleghorn (1951). They include apathy, negativism, depression, inactivity, paranoia, and delusions, and are dangers which are usually readily recognized. The occurrence of other phenomena suggestive of the presence of intracranial lesions is more disturbing and must of necessity, for a time at least, be taken more seriously. Engel and Margolin (1941) were first to draw attention to the fairly typical abnormal electroencephalogram with high-voltage diffuse slow activity which occurred in their patient who was having convulsions. Storrie (1955) has described three further somewhat similar cases. He also observed convulsions. His observations did not support the thesis of Engel and Margolin that the abnormalities were the direct result of hypoglycaemia. The comatose states seen in hypopituitarism have also been recently discussed by Caughey and Garrod (1955). These authors suggested seven possible causes of a comatose condition: post-operative, infections, hypoglycaemia, water intoxication, sodium depletion, hypothermia, and unknown. To this list should be added presence of an expanding intracranial lesion.

In an earlier paper Caughey and Garrod (1954) have stressed the importance of poor adrenal function, while the observations of Sheehan and Summers (1952) certainly indicate that it is not always an easy therapeutic problem to treat these cases of coma with the means available, although they were not then able to employ intravenous hydrocortisone. Our second patient was an example of severe adrenal cortical failure in which crisis was precipitated by mild infection. The disturbance in the first patient with hypopituitarism must be ascribed to slowly developing adrenal cortical failure, but it is important to note the long length of time he took to recover on receiving cortisone therapy. With increasing knowledge of the endocrine changes occurring in hypopituitarism the differentiation of neurosurgical and endocrine causes for cerebral symptoms in these patients will become increasingly more important.

## The Hypothalamus and Pituitary Function

The mechanisms governing the control of corticotrophin are at present much debated. One method of regulation is almost certainly by way of hypothalamic control of the activity of the anterior pituitary. The following case is therefore of great interest.

J. G., a man aged 27, weighed 16 st. (101.6 kg.) (Fig. 14), but had exceeded this and was particularly troubled by nocturnal

enuresis, having a daily urine output of 12 litres, containing up to 400 g. of glucose. At the age of 9 he had had "poliomyelitis" and for some time had noticed blurring of vision. He was somnolent by day, but not sufficient to prevent his working. He had gynaecomastia, sparse head and facial hair, but almost normal axillary and pubic hair. His external genitalia were small. Reduction of visual acuity accompanied bilateral papilloedema with numerous small circumscribed retinal haemorrhages. He had left-sided ptosis and signs suggesting old poliomyelitis in the left arm. His voluntary food consumption was equivalent to 7,000 calories daily.

FIG. 14.—Case J. G. Obesity and gynaecomastia associated with chronic encephalitic lesion especially involving hypothalamic region.

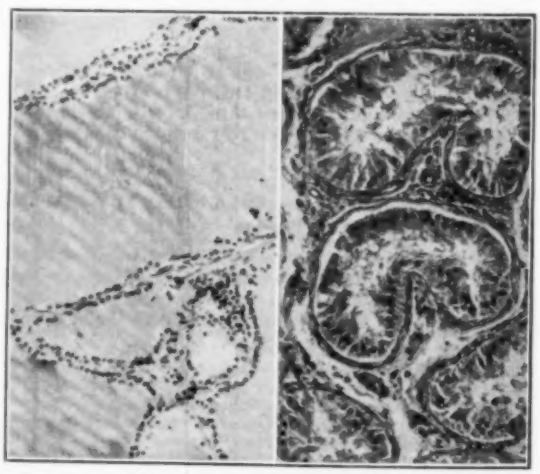
The E.E.G. showed bilateral slow high-voltage activity, especially in the frontal regions, paroxysmal in nature. It was increased by overbreathing and stabilized by photic stimulation. Apart from what turned out to be a falsely positive ethyl iodophenyl-undecylate ventriculogram, suggesting a filling defect in the third ventricle, other neurological investigations were normal. The blood sugar was 300 mg. per 100 ml. and liver glycogen only 0.74%. There was never excess ketone in blood or urine. The blood sugar was unresponsive to adrenaline. F.S.H. was absent from urine. All epiphyses were united. After later control of the glycosuria with insulin he concentrated his urine to only S.G. 1014 by dehydration or with "pitressin." The B.M.R. was plus 15%, but thyroid uptake of $^{131}I$ was only 10%. His response to corticotrophin (89754), both intramuscularly and intravenously, was poor and suggestive of hypopituitarism. At first he required 240 units of soluble insulin daily to control his glycosuria, with a reduction of urine volume to 2 litres. He was then put on a 2,000-calorie diet and given *x*-ray therapy to the infundibular area, whereupon his insulin requirement fell to 30 units daily. He was discharged on insulin and thyroid, but several months later returned with cerebellar symptoms and signs and died with hyperpyrexia.

At necropsy there were old encephalitic lesions of generalized nature, but specially involving the neighbourhood of the tuber cinereum and mammillary bodies (Fig. 15). There were extensive and more recent haemorrhagic lesions in the pons. The pituitary appeared normal; the thyroid showed vesicles filled with colloid and flattened epithelium (Fig. 16); the adrenals were small, and the fasciculata was particularly narrow, with pronounced pigment granules in the inner zone and shrunken reticula; the testicles showed a considerable impairment of spermatogenesis with prominent Sertoli cells, and Leydig cells were reduced in number. Breast tissue showed considerable duct hyperplasia.

Harris (1955b) has carefully reviewed the evidence from experimental work on the hypothalamus and concludes that external stimuli to the anterior pituitary can pass by two pathways. The ordinary day-to-day stimuli are transmitted through nervous pathways, whereas stimuli can also pass by a direct metabolic mechanism. The animal experiments on which this conclusion is based are of two types: section of the pituitary stalk with care to avoid regeneration of the portal vessels, or stimulation of the various parts of the hypothalamic region and production of experimental lesions in this region. Thus stimulation of the posterior part of the hypothalamus in monkeys causes corticotrophin release (Porter, 1954). Pituitary stalk section need only lead to slight atrophy of the anterior pituitary and some atrophy of the adrenal cortex. It is reasonable to suppose that in our patient sufficient stimulation of the anterior pituitary remained by extrahypothalamic pathways to maintain the adrenal in its subnormal state of activity and to give the somewhat reduced positive response to injected corticotrophin. The decreased uptake of $^{131}I$ in our patient closely follows Harris's (1955b) finding of reduced thyroid activity in the rabbit with pituitary stalk section.

With regard to gonadotrophin secretion, most experimental work has been done in female animals, but Benoit and Assenmacher (1953) found that isolation of the anterior pituitary of the duck caused decreased testicular function and atrophic changes. The changes in our patient were of partial degree and less severe than those often seen in anterior hypopituitarism (Howard, Sniffen, Simmons, and Albright, 1950). Similarly, the adrenal atrophy had not progressed to the degree often occurring in anterior

FIG. 15.—Case J. G. Typical encephalitic lesion adjacent to mammillary body. (×280.)



A B

FIG. 16.—Case J. G. A Quiescent thyroid. B. Testicle. Note the basement membrane, diminished spermatogenesis, prominent Sertoli cells, and reduction of interstitial cells. (×110.)

hypopituitarism (Sheehan and Summers, 1949). In a series of 60 cases showing endocrinological disturbances as a result of damage in the hypothalamic area meningo-encephalitic lesions were uncommon (Bauer, 1954). The most prominent change was alteration of sexual pattern, precocious puberty, or hypogonadism. In the latter group tubero-infundibular lesions predominated, and when examined the pituitary was usually normal. Patients with encephalitis most resembling ours, but less completely investigated, are those of Moore and Cushing (1935) and of Ayala (1934). They both, however, had diabetes insipidus; in the former, irradiation of the region of the sella reduced urine volume. In monkeys the hypothalamic nuclei are known to be sensitive to irradiation (Arnold, 1954).

Glycosuria is a rarity in such cases and ketosis seems to occur (Paton and Petch, 1954). Long (1940) reviewed the evidence, including that from experiments, that hypothalamic lesions cause glycosuria, and concluded that they do not permanently alter the control of blood glucose. He favoured the view that hypothalamic or brain-stem lesions cause disturbance via the sympathetic system and adrenal medulla. Our patient had no evidence of sympathetic overactivity, except possibly the small increase of basal metabolic rate. His history seemed to indicate the presence of polyuria due to glycosuria for a long period. The complete absence of ketosis, even with severe depletion of liver glycogen, still needs explanation.

## Developing Ideas in Relation to Cushing's Syndrome

In typical cases the diagnosis of Cushing's syndrome is simple; in the causative type of adrenal cortical lesion the diagnosis may prove more difficult, and also in the less typical and related cases. It was only recently noticed how poor is the prognosis of the condition; of 32 patients, 17 were dead within five years (Plotz, Knowlton, and Ragan, 1952). In a study of a series of 40 patients, Soffer, Eisenberg, Iannoccone, and Gabrilove (1955) noted significant deviations from the classical form of obesity. Indeed, the facies may not always show the classical "moon" picture, but more nearly suggest benign obesity. The commonest abnormality, present in 80% of patients, is hypertension, which ultimately leads to irreversible systemic damage. The possible presence of a malignant tumour needs serious consideration before becoming inoperable or metastasizing. When appraising the views of our American colleagues it must be remembered that the occurrence of benign and malignant tumours is more frequent in North America than in Europe. Of 127 American cases, 40% had tumours (Sprague, 1953; Soffer *et al.*, 1955; Forsham *et al.*, 1955). European figures are more difficult to obtain, but the incidence in 57 cases appears to be about 7% (Luft, 1955; Querido, 1955).

It was once thought that the level of 17-ketosteroid excretion was a valuable sign (Forbes and Albright, 1951), but this is only sometimes true (Soffer *et al.*, 1955). The use of recent methods of assay of corticoids and their metabolites has been of help in the diagnosis of Cushing's syndrome, but not of the presence of tumours. In a series of 62 patients, 8 gave normal or doubtful values (Sprague, 1953; Soffer *et al.*, 1955). With a different technique Dustan *et al.* (1953) reported 8 out of 11 patients with normal values. It seems undoubted that a few patients with upper normal values will be found (Laidlaw *et al.*, 1955). It may, however, yet prove to be the case that an estimate of the free or unconjugated hydrocortisone and cortisone in the urine is of more definitive value (Gray, 1955; Cope and Harrison, 1955; see also Dustan *et al.*, 1953). Estimates of plasma corticoids and metabolites give a similar picture, and may be

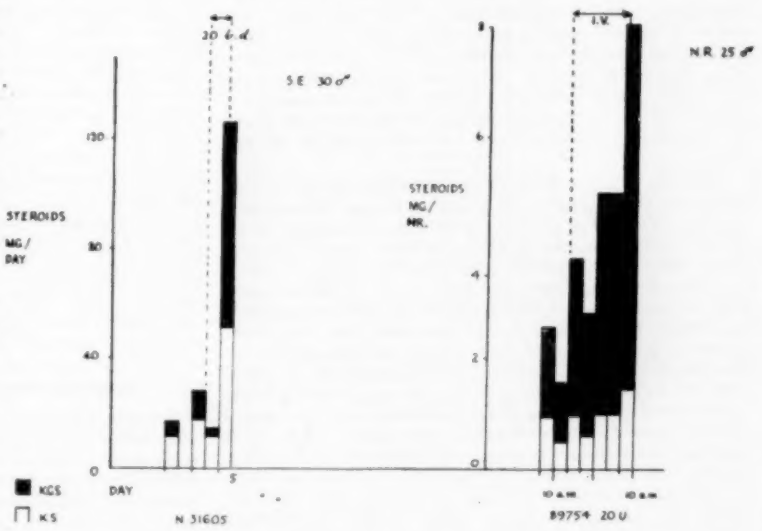



FIG. 17.—Response in urine steroids of patients S. E. and N. R. with non-tumorous adrenal cortices in Cushing's syndrome to corticotrophin. A. Corticotrophin intramuscularly. B. Intravenously. (Compare Fig. 4.)

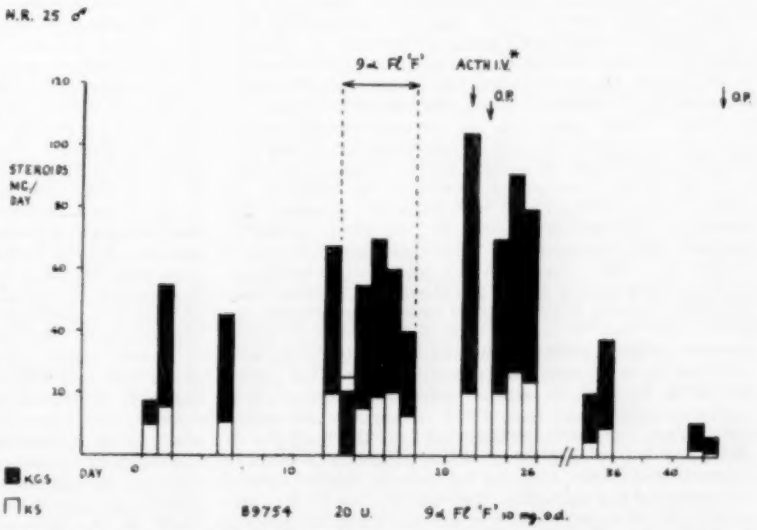



FIG. 18.—Responses of patient with Cushing's syndrome with non-tumorous gland. Failure of depression of steroids by 9α-fluorohydrocortisone, 10 mg. daily by mouth. Considerable increase in ketogenic steroid excretion after unilateral adrenalectomy (see text).

difficult to interpret because of the possibility of confusion with emotional factors (Bayliss, 1955).

An approach to the differentiation of malignant tumours from adrenal hyperplasia is the use of corticotrophin. Patients with overactive adrenals are very responsive (Fig. 17). Patient S. E. had adrenal hyperplasia and N. R. had adrenals of normal size but prominent zona fasciculata; both had pronounced Cushing's syndrome. Caution is needed in carrying out these tests, for cardiac failure may be precipitated. A rapid increase of blood corticoids or excretion of corticoid metabolites in patients of this type has also been noted by Burnett, Rukes, Kolb, and Forsham (1954) and by Laidlaw *et al.* (1955). The lability of the level of steroid excretion should be noted. In patient S. E. plasma hydrocortisone was 25 μg. per 100 ml. and in N. R. values of 11 and 24 μg. per 100 ml. were found.

On the other hand, the response of patients with adrenal cortical carcinoma to corticotrophin is said to be absent, on account of the autonomous nature of the tumour cells. This was not our experience in patient J. H. (Brooks, McSwiney, Mills, Prunty, Robertson, and Wood, 1956), who showed a significant rise of ketogenic steroids and ketosteroids with corticotrophin. The resting output of these steroids was high, but the plasma hydrocortisone was only 8 to 10 μg. per 100 ml.

A second possible method of differentiation of tumour patients is that suggested by Venning, Pattee, McCall, and Browne (1952). The principle is to suppress cortical secretion of a non-tumorous gland by administration of a substance which will suppress corticotrophin secretion. Cortisone does this, but, since it also gives rise to significant quantities of corticoid metabolites, it is necessary to measure suppression of ketosteroids. This technique has been fairly successful in the hands of Jailer, Gold, and Wallace (1954), but cannot be regarded as very satisfactory (Wilkins, 1955). With the advent of 9α-fluorohydrocortisone, which is active in very small amounts, the situation has theoretically changed (Thorn, Renold, Morse, Goldfien, and Reddy, 1955), as it produces insignificant amounts of measurable metabolites. Aldosterone is not powerful enough in its corticoid effects to suppress the anterior pituitary to a useful extent (Prunty, McSwiney, Mills, and Smith, 1954). Cope and Harrison (1955) have observed suppression of free hydrocortisone in the urine with 9α-fluorohydrocortisone, but its effects in the hands of Nabarro and Walker (1955) have been variable. In Fig. 18 is seen its effects in patient N. R. No significant steroid suppression occurred.

Since the description by Conn (1955) of a patient with adrenal cortical tumour a new facet of the problem has appeared, and as many as 13 similar patients are now known (Conn and Louis, 1956; Brooks *et al.*, 1956). So far as can be determined at present, important features are hypertension, tendency to obesity, polyuria, and cramps with muscular weakness. These need not be present simultaneously. These patients also have low serum potassium levels and alkalosis. For many years these blood changes have interested the Mayo Clinic group, headed by E. J. Kepler; a recent survey of 83 patients with Cushing's syndrome has shown that 41% had alkalosis and 13% low serum potassium (Sprague and Power, 1953). These changes occurred in patients with both hyperplasia and tumour. An important additional biochemical finding in the group of atypical cases mentioned may be the presence of excess aldosterone in the urine. This can be present with normal corticoid metabolites and ketosteroids (Conn and Louis, 1956), or with elevation of these substances (Foye and Feichtmeir, 1955; Brooks *et al.*, 1956), or with an apparent increase of corticosterone (Mader and Iseri, 1955). Conn gave the unfortunate term "primary aldosteronism" to the condition to distinguish it from that state in which patients with subacute nephritis also excrete excessive aldosterone. Adrenal cortical tumours need not necessarily be present (*Lancet*, 1955; Conn and Louis, 1956), but adenomas are usual, and occasionally carcinoma (Foye and Feichtmeir, 1955; Brooks *et al.*, 1956). The exact relationship of aldosterone secretion to corticotrophin stimulation is not settled, but the pituitary hormone does not appear to be essential (Gaunt, Renzi, and Chart, 1955; Falbriard, Muller, Neher, and Mach, 1955).

The lability of secretion of corticoid in these patients with Cushing's syndrome is also shown in the very pronounced rise in ketogenic steroids observed in response to unilateral adrenalectomy. From radiological evidence, I.V.P., and air insufflation it was thought likely that N. R. had a tumour of the left adrenal cortex. At operation it was found that the appearances were due to a large fibrofatty pad of tissue lying above the adrenal, which complicated the surgical procedure kindly carried out by Mr. R. H. O. B. Robinson. After the removal of this adrenal there was a sharp increase in ketogenic steroid excretion (Fig. 18) and the operation was followed by a severe sepsis of the area that was difficult to control. In addition there developed intractable haematemesis from large acute gastric ulcerations, from which the patient ultimately succumbed. This difficulty of healing has also been noted by Jepson *et al.* (1956) in a patient who did not have Cushing's syndrome but spontaneously responded in an exaggerated fashion with respect to the secretion of ketogenic steroids. The occurrence of spontaneous intestinal haemorrhage in Cushing's syndrome is apparently rare, Plotz *et al.* (1952) noting a death rate from this cause of less than 2%.

On the other hand, the occurrence of gastric bleeding in patients undergoing treatment with cortisone is quite well recognized. In Cushing's syndrome, where there is such lability of corticoid secretion, there may be risks in the postoperative period if only unilateral adrenalectomy is performed as a first-stage operation. The type of post-operative steroid response in this patient is also important. It resembles the response to corticotrophin, the ketogenic steroid: ketosteroid ratio being high, and is quite different from the response of the hirsute patient L. C. (Fig. 11).

### Adiposity Resembling Cushing's Syndrome

Simpson (1951, 1953) made a study of a group of patients with obesity commencing in childhood who, he felt, had some form of altered adrenal cortical activity. Among the patients reviewed here several have had signs, particularly obesity and red striae, suggesting altered adrenal function (see L. D. and R. S. in Table VIII), but hypertension was mild or absent. Their response to corticotrophin does not show the pattern of Cushing's syndrome; indeed, in R. S. it was quite different. An extreme example is C. L., aged 18, who developed obesity at the age of 10; puberty was normal, but suddenly at 18 he developed very severe red lineae distensae (Fig. 19). He had a full plethoric face, a pre-diabetic sugar curve, and mild hypertension. His tallness seemed to be familial. *X*-ray studies, serum electrolytes, urinary ketosteroids, and ketogenic steroids were normal. Plasma hydrocortisone was 2.5 and 3.5 μg.%. He showed a normal (not increased) response to corticotrophin (89754). He improved after pituitary irradiation and with reducing diet. We are inclined to agree with Simpson that there is an underlying abnormality of adrenal cortical function in these individuals which by present methods fails to be demonstrated. Such patients are not uncommon and their treatment remains a challenge.

FIG. 19.—Case C. L. Obesity.

In conclusion, it seems that when allowances are made for varying activity of corticotrophin preparations, and conditions are otherwise standardized, different patterns of response of the adrenal cortex may be discerned. In addition to the hyperactive response seen in certain patients with Cushing's syndrome there are those interesting ones with a low basal activity but potentially very responsive to stimulation. Some mechanism other than the enzymatic lesion of pre-pubertal virilism appears to control the relative production of corticoid and androgen, and this may be disturbed in varying conditions, including hirsutism.

The part played by central nervous control of the anterior pituitary through the hypothalamus must be acknowledged. Information on the interaction of hormones from other glands on the activity of the adrenal cortex is scanty and needs to be increased; probably the thyroid is particularly worthy of further study. The effects of metabolic derangement on the function of the central nervous system, including the mimicry of some manifestations of space-occupying lesions, is of practical importance. With the discovery of aldosterone the problem of differentiating the hormonal abnormalities in Cushing's syndrome and allied states has increased in complexity.

## Summary

Relevant knowledge of compounds secreted by the adrenal cortex and their metabolism is reviewed. Experiments are discussed which give information about the action of corticotrophin in man. Difficulties in evaluating the response due to variations in the activity of different batches of corticotrophin are stressed. After making due allowance for these difficulties, it is possible to define a "spectrum" of response in individuals with various pathological entities. Particular attention is drawn to the response of patients with idiopathic hirsutism, and the effects are contrasted with those in hypopituitarism and normal childhood on the one hand, and in adrenal cortical virilism on the other. Comparisons are made between the effect of exogenous corticotrophin and the endogenous stimuli produced by surgical trauma.

A condition of "basal hypo-adrenal corticalism" is defined and its significance discussed. The possibility of synergic action between corticotrophin and a factor associated with growth hormone, gonadotrophins, and thyroid hormones is considered. There seems little doubt that thyroid hormones are of great importance in the responsiveness of the adrenals. Evidence concerning the existence of a potentiating factor to corticotrophin for the stimulation of adrenal androgens is shown to be worthy of consideration. A similarity in behaviour of certain adult male obese subjects to that of hirsute women is noted and contrasted with others bearing a superficial resemblance to patients with Cushing's syndrome.

Attention is drawn to clinical problems in relation to alterations of cerebral activity in patients with Addison's disease and hypopituitarism and to difficulties which arise when space-occupying intracerebral lesions may be present. A patient with long-standing encephalitis has been studied, with particular reference to the secondary endocrinological phenomena which ensued, and the significance of these is discussed. Recent advances and ideas in relation to the diagnostic problems in Cushing's syndrome and in patients with adrenal cortical tumours, particularly when hypocalcaemia and renal symptoms are present, are considered and supplemented with additional observations.

ADDENDUM.—Since this manuscript was prepared additional confirmatory evidence has been obtained in another patient in support of the effects of tri-iodothyronine on corticotrophin stimulation in hypopituitarism.

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# EFFECTS OF HEAVY AND REPEATED MALARIAL INFECTIONS ON GAMBIAN INFANTS AND CHILDREN

## EFFECTS OF ERYTHROCYTIC PARASITIZATION

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Since 1947, when the Medical Research Council established its laboratories in the Gambia, many workers investigating the importance of non-parasitic diseases in the African population have found great difficulty in assessing the contribution to the general picture of the inevitable malarial infection. McGregor and Smith (1952) and Walters and Waterlow (1954) found the twin threads of parasitization and malnutrition exceedingly complex and difficult to unravel. In no section of the community is this complication more in evidence than in infancy and early childhood—when plasmodial infection is severe and almost universal. This paper describes the result of an investigation in the Sukuta area of the Gambia that was undertaken to determine precisely the effects, both immediate and long-term, of repeated and heavy malarial infections on infants and young children.

Sukuta is one of the principal villages in the Kombo St. Mary District of the Gambia, and as such it possesses

an infant welfare centre which serves the surrounding villages within a radius of 10 miles. It is the centre of a dominantly agricultural Mandinka community which depends for food largely upon the cereals that are grown in the rainy season. Maize and digitaria are produced in small quantities in the early part of the rains, while staple cereals—rice, sorghum, and millet (*pennisetum* spp.)—are raised in the latter part. Groundnuts are grown principally as a cash crop, but some 10% of the yield is consumed annually as food. Cattle are kept in considerable numbers, but as they are seldom killed they contribute little to village food supplies. Milk yields are low, and when the requirements of calves are satisfied little remains for human consumption. Fish is relatively abundant in the coastal region, and considerable quantities are eaten even in the more inland villages.

In the area under consideration malaria is hyperendemic. Transmission declines in the dry months from December and May, when it becomes negligible, but rises dramatically with the onset of the rains in June, to reach a peak in October and November. *A. gambiae gambiae* is the dominant vector in the inland reaches, but in coastal villages associated with Avicennia mangrove swamps it is of secondary importance to *A. gambiae melas*. *P. falciparum* is by far the most commonly encountered parasite, but *P. malariae* and *P. ovale* are not infrequently seen.

In June, 1951, the investigation described here began with the creation of two experimental groups of newly born African infants at the Sukuta Infant Welfare Centre. The infants were assigned to either group by random selection. Infants in one group received 6 mg. of chloroquine base per kg. of body weight each week, while those in the other group received only a lactose placebo and were thereby maintained as controls. When each group contained 26 members no further infants were included. The sister in charge of the centre was advised to regard the experimental children as being in no way different from the other infants attending the clinic. If, in her opinion, an infant of the control series required antimalarial treatment, she was at complete liberty to administer any of the standard treatment courses that are used in Gambian dispensaries. Similarly, any non-malarious illness developing in members of either group had to be treated in accordance with her normal practice. An essential point of the experiment was that the established custom of infant-feeding in a rural Gambian community should not be modified: no supplements, such as skimmed milk, were therefore permitted.

When the children of the protected series reached the age of 2 years the weekly dosage level of 6 mg. of chloroquine base per kg. was discontinued and a flat rate of 150 mg. of base substituted. Both groups of children were regularly inspected and examined in the field, and in October, 1954, they were admitted to the research ward of the Medical Research Council's Laboratories at Fajara for detailed investigation and comparison. The methods used in the investigations and the results obtained are here reported.

## First Investigation

### Methods

Members of the two groups were visited weekly by a nursing sister who administered chloroquine to the protected and placebo to the unprotected series. The chloroquine, in powder form, was mixed in a teaspoon with water and care was taken to ensure that each infant swallowed its dose. Vomiting was noted to be a frequent sequel to treatment in the protected infants, and the practice of observing each baby for 30 minutes after drug administration was instituted. If vomiting did not occur within that period satisfactory retention was assumed. If, however, it occurred the dosage was repeated. As members of the protected series grew older the frequency of the vomiting decreased until it was no longer necessary to continue the observation period.

Thick and thin blood films were taken from each infant at each weekly inspection. The thick films were subsequently stained by Field's rapid method and examined microscopically under 1/12 in. oil immersion lens, 100 consecutive fields of each being examined. Thin films were fixed in methyl alcohol and stained by Giemsa's method.

At monthly intervals the members of both series were examined by a medical officer and details of weight, diet, and colour of hair were recorded. The sizes of liver and spleen were found by palpation, and haemoglobin values, as assessed by the Dare haemoglobinometer, were noted.

### Results

Extreme difficulty was encountered throughout the investigation in preserving the size of the experimental groups, and, although each had contained 26 members initially, by the autumn of 1954 the number had dwindled through death and change of domicile to 20 protected and 13 unprotected children. Moreover, by this time 3 of the 20 protected children had each experienced a single short attack of malaria. These attacks originated in the failure, despite many attempts, to continue weekly chloroquine dosage. Mothers without warning would depart, taking their children with them on visits to distant relatives. On their return such children were examined closely for evidence of malaria contracted in their lapse from treatment, and, initially, all infected ones were excluded from the protected series. Ultimately these children who were known to have been infected for only a short period were retained. The three children referred to above were known to have been infected for less than 10 days.

By October, 1952, before movement of the parents had reduced the size of the groups, one child of the protected series and five of the controls had died, thus producing group mortality rates of 3.8% and 19.2% respectively. The difference in these rates is not statistically significant. All deaths took place in the first 16 months of life. The precise cause of death (acute gastro-enteritis) could be established only in the case of the protected child. All the unprotected children who died were known to have been heavily infected with malaria immediately before death. From October, 1952, to November, 1954, no further deaths occurred, even in those whose regular drug prophylaxis had lapsed.

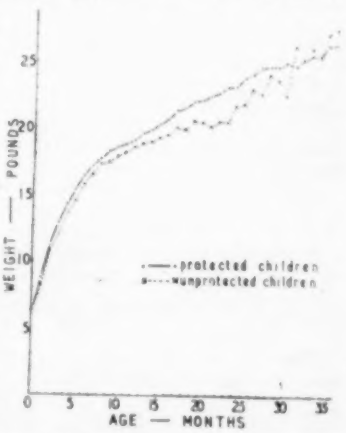


FIG. 1.—Average weight curves of protected and unprotected children during first three years of life.

Analysis of the dietary notes kept throughout the investigation showed that supplements to breast milk were started on the average at 4½ months. These supplements comprised paps of the common local cereals—rice, sorghum, and

millet. Weaning took place at the average age of 22 months, by which time the child was receiving a good mixed cereal diet with additions of meat and fish.

Fig. 1 expresses graphically the average weight curves of protected and unprotected children over the first three years of life. It will be noted that as age progresses and malaria infection becomes frequent the unprotected children lag behind their protected fellows. Nevertheless, at no time in the first three years is the weight difference statistically significant. By the end of the second year of life the unprotected children begin to make more rapid weight gains, and by the 36th month appear to have overtaken the protected children.

Figs. 2 and 3 contrast the weight development of a protected child with that of its control through successive wet and dry seasons. It is of interest to note that the subjects whose weights are recorded in Fig. 2 were homozygous (or uniovular) twin girls reared by their mother in identical circumstances.

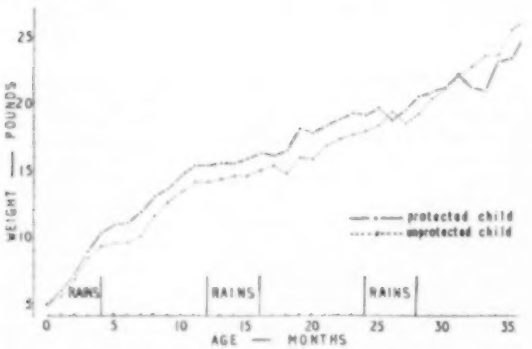


FIG. 2.—Weight development of a protected child and of its control. These two children were homozygous twins.

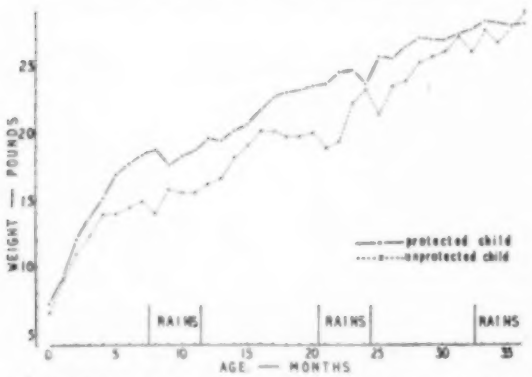


FIG. 3.—Weight development of a protected child and of its control.

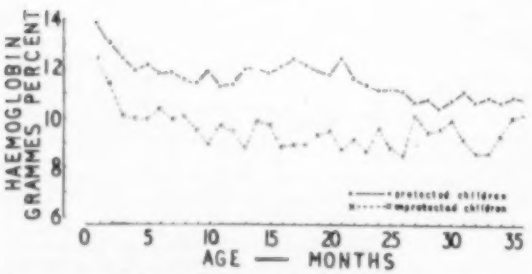


FIG. 4.—Mean Hb values of protected and unprotected children during first three years of life.

Both figures illustrate the tendency shown by all unprotected children to gain weight more slowly, and occasionally to lose weight in the wet malarious months than in the dry season.

Fig. 4 contrasts the mean haemoglobin values in children of both series from the end of the first month of life until the 36th month. The much lower level of the unprotected children will be noted.

In November, 1952, 25 protected children and 17 controls were examined. Table I contrasts the clinical findings.

TABLE I.—*Clinical Findings (November, 1952)*

| | Protected Group | Unprotected Group |
|---|---|---|
| No. in group | 25 | 17 |
| Percentage with parasitaemia | 0 | 100* |
| " " splenomegaly | 0 | 88·3* |
| " " liver palpable below costal margin in mid-axillary line | 4 | 88·3* |
| Percentage with hair dyspigmentation | 32 | 53 |
| Mean haemoglobin (g.%) | 12·1 (S.D. 1·06) | 9·5%* (S.D. 1·22) |

* Values statistically significant.

## Second Investigation

### Methods

In October and November, 1954, 16 children of the protected series and 13 of the unprotected series were admitted to the ward of the Medical Research Council's Laboratories for detailed clinico-pathological investigation. Each child remained in hospital for five days, during which time liver biopsy was performed with the parents' sanction. Specimens of urine, stool, and blood from each child were examined in the following ways.

1. *Urine* was tested for specific gravity and the presence of protein, sugar, bile, blood, and casts.

2. *Stools.*—Microscopical examination of both fresh saline and salt-flotation preparations for protozoal and helminthic parasites. Densities of helminth ova were calculated by a modification of the Stoll technique.

3. *Blood.*—(*a*) Thick and thin films were examined for the presence of plasmodia. (*b*) Thick films, prepared at 11 p.m., were dehaemoglobinized, fixed in methyl alcohol, stained with haem-alum, and examined for the presence of microfilariae. (*c*) Haemoglobin values were assessed, using the M.R.C. Grey Wedge photometer. In each case the mean of ten readings was taken. (*d*) Erythrocyte sedimentation rates were obtained by Wintrobe's method. (*e*) Packed cell volume was read after centrifuging for thirty minutes at 6,000 revolutions a minute. (*f*) Red- and white-cell enumeration was performed on a Neubauer "bright ruling" haemocytometer. (*g*) Sickling tests were made, employing the sealed cover-slip technique and using a 2% solution of sodium metabisulphite as a reducing agent. (*h*) Samples of serum were forwarded by air to the United Kingdom for various treponemal tests. (*i*) Total serum proteins were estimated by a semimicro-Kjeldahl method, using a selenium-sulphuric acid catalyst. For the estimation of serum albumin, serum globulin was precipitated by 25% sodium sulphate. The difference between total serum protein and serum albumin results was taken as the serum globulin value. Non-protein nitrogen was estimated separately after the serum had been deproteinized by a modified Folin-Wu tungstic acid reagent. (*j*) Electrophoresis of serum proteins was effected in a horizontal tank containing a barbiturate buffer (*p*H 8.6) to which a small quantity of fungicide (sodium salicylanilide) had been added. Serum (10–20 $\mu$l.) was applied by coverslip to Whatman's No. 2 (chromatography) filter paper. A direct current (120 v.), obtained from a high-tension dry battery, was passed through the filter paper for 20–22 hours. Electrophoretograms were fixed by heat, stained with azocarmine "B" and "scanned" in a Joyce-Loebel densitometer.

### Results

The results of the liver biopsy will be dealt with later in a separate publication. The detailed results of the other investigations are shown in Tables II–IX and Fig. 5.

All the children appeared fit and well, and no difference in physical agility or mental acuity could be detected between members of the two groups. The mean weight of protected children was slightly lower than that of the unprotected children, but the former were slightly the taller (Table II).

No marked nutritional deficiencies were found in any child, and both groups were assessed as being in good nutritional condition (Table III).

All children of the unprotected series showed considerable enlargement of both liver and spleen (Table IV). In only two of the protected children could the liver be palpated below the costal margin in the mid-axillary line, and in only one child of this series could the spleen be felt. In this latter case splenic enlargement was small and the child was known to have experienced a short attack of malaria a few months before.

Examination of thick and thin blood films revealed that all the unprotected children were infected with malaria (Table V). In every instance the children were apyrexial and the infection seemed to be completely asymptomatic. Parasite densities varied in individuals from 20 to 3,000 per 100 oil fields of thick blood films. The frequencies of infecting plasmodia were *P. falciparum* 100%, *P. malariae* 61.5%, and *P. ovale* 7.7%.

Examination of night films did not reveal the presence of microfilariae in the blood of any child. The incidence of infection with intestinal helminths was higher in the protected series, but the density of these infections appeared to be greater in the unprotected children. The mean egg loads per gramme of faeces in protected and unprotected children respectively were: hookworm, 600 and 900; ascaris, 12,400 and 23,800; tapeworm, 1,600 and nil.

In only one case, that of an unprotected child, could any gross urinary abnormality be detected. This child showed a marked proteinuria (Esbach 1.125 g.%) but seemed physically fit and well and the N.P.N. value of her serum was within normal limits. No evidence of oedema could be detected on clinical examination. Microscopy of the uncentrifuged urinary deposit revealed both granular and hyaline casts, epithelial cells, and a few blood cells of both the red and white series. The blood of the child showed a fairly dense *P. malariae* infection, and while it is clear that the urinary condition could easily have been completely independent of this the possibility that it was a sequel to quartan malaria must be borne in mind.

While the mean haemoglobin concentration of each group showed practically no difference the mean erythrocyte concentration and the mean haematocrit value of the unprotected children were considerably lower than those of the protected series (Table VII). Both groups showed a degree of normocytic anaemia, that of the unprotected children being the greater. Erythrocyte sedimentation rates in the malarious children were much higher, despite the asymptomatic nature of the infections, than those of the non-malarious group.

In the serum of only one child, positive results were obtained in the Wassermann, cardiolipin Wassermann, Kahn, and treponemal immobilization tests. A positive pallida reaction was also obtained. This child was one of the two protected children in whom enlarged livers were palpated, and the possibility that luetic disease was responsible for the enlargement must be considered.

The mean total serum protein values, as determined by chemical estimation, were found to be approximately 0.5 g.% higher in the unprotected children (Table VIII). Fractionation of the serum proteins revealed that mean

TABLE II.—*Mean Ages, Heights, and Weights (October–November, 1954)*

| | Protected Children | Unprotected Children |
|---|---|---|
| No. in group | 16 | 13 |
| Average age (weeks) | 161·68 | 161·15 |
| Average birth weight (oz.) | 103·75 (S.D. 19·92) | 100·53 (S.D. 17·74) |
| ,, weight in October–November, 1954 (oz.) | 464·50 (S.D. 59·65) | 466·15 (S.D. 45·03) |
| Average weekly weight gain since birth (oz.) | 2·23 | 2·26 |
| Average height in October, 1954 (in.) | 35·82 (S.D. 1·39) | 34·49 (S.D. 1·88) |

1 oz. avoirdupois equals 28·35 g.; 1 inch equals 2·5 cm.

TABLE III.—*Clinical Nutritional Assessment (October–November, 1954)*

| | Protected Children | Unprotected Children |
|---|---|---|
| No. in group | 16 | 13 |
| Skin changes: xerosis, crackling, P.G.F., follicular keratosis, dyssebacia | 12·5% | 15·38% |
| Muscle mass | Good | Good |
| Bone changes: genu valgum, frontal bossing, beaded ribs, enlarged epiphyses | 25·0% | 46·14% |
| Mucosal changes: angular stomatitis, cheilosis, tongue changes | 12·5% | 23·0% |

TABLE IV.—*Incidence and Degree of Hepatomegaly and Splenomegaly (October–November, 1954)*

| | Protected Children | Unprotected Children |
|---|---|---|
| No. in group | 16 | 13 |
| Hepatomegaly: | | |
| 1 F.B. below costal margin | 12·5% | 23·1% |
| 2 ,, ,, ,, ,, | Nil | 46·2% |
| 3 ,, ,, ,, ,, | ,, | 30·8% |
| Splenomegaly: | | |
| Just palpable | 6·3% | Nil |
| 1 F.B. below costal margin | Nil | 7·7% |
| 2 ,, ,, ,, ,, | ,, | 7·7% |
| 3 ,, ,, ,, ,, | ,, | 30·8% |
| 4 ,, ,, ,, ,, | ,, | 23·1% |
| 5 ,, ,, ,, ,, | ,, | 23·1% |
| 6 ,, ,, ,, ,, | ,, | 7·7% |

TABLE V.—*Incidence of Parasitic Infection (October–November, 1954)*

| | Protected Children | Unprotected Children |
|---|---|---|
| No. in group | 16 | 13 |
| Malaria | 0 | 100% |
| Filariasis | 0 | 0 |
| Hookworm | 68·8% | 38·5% |
| Ascaris | 68·8% | 38·5% |
| Tapeworm | 6·3% | 0 |
| *E. histolytica* | 0 | 0 |

TABLE VI.—*Urinary Findings (October–November, 1954)*

| | Protected Children | Unprotected Children |
|---|---|---|
| No. in group | 16 | 13 |
| Specific gravity (av.) | 1019·6 (S.D. 11·89) | 1017·6 (S.D. 6·59) |
| Albumin: | | |
| Trace | 18·8% | 38·5% |
| Heavy | Nil | 7·7% |
| | | Esbach 1·125 g.% |
| Sugar | ,, | Nil |
| Bile | ,, | ,, |
| Casts | ,, | 7·7% |
| Blood | ,, | 7·7% |

TABLE VII.—*Mean Haematological Values (October–November, 1954)*

| | Protected Children | Unprotected Children |
|---|---|---|
| No. in group | 16 | 13 |
| E.S.R. | 31·1 (S.D. 12·05) | 50·84 (S.D. 2·11) |
| Haemoglobin | 11·28 g.% (S.D. 0·91) | 10·88 g.% (S.D. 1·248) |
| R.B.C. per c.mm. (millions) | 4·00 (S.D. 0·361) | 3·688 (S.D. 0·416) |
| P.C.V. | 34·37% (S.D. 1·61) | 31·96% (S.D. 2·54) |
| M.C.V. | 86·25 c.$\mu$ (S.D. 8·28) | 86·92 c.$\mu$ (S.D. 5·48) |
| M.C.H.C. | 32·81% (S.D. 1·83) | 33·84% (S.D. 2·28) |
| W.B.C. (thousands) | 9·288 (S.D. 2·84) | 9·980 (S.D. 2·76) |
| Sickling trait | 12·5% | Nil |

TABLE VIII.—*Mean Serum Proteins and Non-protein Nitrogen Values (October–November, 1954)*

| | Protected Children | Unprotected Children |
|---|---|---|
| No. in group | 16 | 13 |
| Chemical estimation: | | |
| Total proteins | 7·13 g.% (S.D. 0·4429) | 7·59 g.% (S.D. 0·4309) |
| Albumin | 3·92 g.% (S.D. 0·5295) | 3·83 g.% (S.D. 0·3567) |
| Globulin | 3·20 g.% (S.D. 0·4017) | 3·76 g.% (S.D. 0·3640) |
| Non-protein nitrogen | 20·85 mg.% (S.D. 6·33) | 19·07 mg.% (S.D. 4·28) |

albumin values for each group were almost identical but that the mean globulin value was higher in unprotected children. Non-protein nitrogen serum values were similar in both groups.

Fig. 5 shows the graphs obtained by "scanning" the electrophoretograms of an unprotected and a protected child. The strikingly high gamma-globulin fraction of the former will be noted.

When a pattern similar to the above had been prepared on standard graph paper for each child of both series it was cut out with scissors and weighed. A perpendicular to the baseline was then dropped from the lowest point of the trough between the curves representing the beta- and gamma-globulin fractions and, by cutting along this, the gamma portion of the pattern was severed from the remainder. This portion was then weighed and its weight as a percentage of the total graph calculated. In this way the mean serum gamma-globulin was estimated to be 24.43% (S.D. 5.74) of the mean total serum protein value in the protected children and 32.21% (S.D. 4.39) in the unprotected children. It is thus apparent that the gamma-globulin content of the serum of the malarious children was almost one-third as great again as that of the non-malarious children.

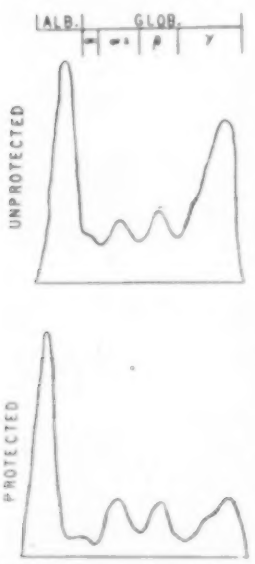


FIG. 5.—Graphs obtained from electrophoretograms of an unprotected and a protected child.

It is unfortunate that the small size of each experimental group limited the value of the statistical analysis of results. Nevertheless we have thought that such analysis would prove helpful to the reader in assessing the relative importance of the difference between protected and unprotected children. Table IX therefore summarizes these differences in mean values observed, which were greater than twice the standard error of the difference. All other differences reported in this second investigation were less than twice this value.

TABLE IX.—*Major Differences Detected Between the Protected and Unprotected Groups*

| | Difference Between Mean Values or Proportions of Groups | Standard Error | Difference Divided by Standard Error |
|---|---|---|---|
| E.S.R. | 19·74 | 3·07 | 6·43 |
| Splenomegaly | 93·75 | 18·66 | 5·02 |
| Hepatomegaly | 87·50 | 18·66 | 4·68 |
| Gamma globulin (by electrophoresis) | 7·78 | 1·88 | 4·14 |
| Serum globulins (by chemical estimation) | 0·56 | 0·14 | 4·0 |
| P.C.V. | 2·41 | 0·80 | 3·01 |
| Total serum proteins (by chemical estimation) | 0·46 | 0·16 | 2·87 |
| R.B.C. | 0·312 | 0·145 | 2·15 |
| Height | 1·33 | 0·65 | 2·04 |

## Discussion

Before discussing the results observed in this investigation it must be remembered that chloroquine afforded the treated children protection only against the erythrocytic phases of the malaria parasite. It is known that the drug has no action on sporozoites or on the exo-erythrocytic phases of infection, and it must be assumed that sporozoite entry and subsequent exo-erythrocytic development occurred normally in both groups, but that in the treated children no further parasitic growth took place. It is clear, therefore, that only the erythrocytic phases can be held responsible for the production of the differences observed between treated and untreated children.

From the above results one is led to deduce that malaria exerted its maximal effects in the first 18 months of life and that by the age of 3 years the unprotected children had developed a considerable immunity to the disease, as witnessed by their ability to live asymptomatically with fairly dense parasitaemia. While the difference in the mortality rates of the two groups, which were of small size, was not statistically significant, and while the cause of death of the five unprotected children could not be ascertained, the possibility that comes to mind first, and cannot be excluded, is that the difference was related to the presence or absence of overt malaria infection.

Study of the weight curves of children of both groups indicates that acute clinical malaria tended to retard growth. This retardation did not appear to be in any way permanent, for when the malarious children had developed enough resistance to the noxious effects of the disease they rapidly regained lost ground and, despite the persistence of moderately severe parasitaemia, by the third year of life were just as heavy as their protected fellows. It should not be forgotten, however, that at this age the grossly enlarged livers and spleens of the malarious children must have contributed a disproportionate sum to the total body weight, whereas that of the protected children represented presumably normal body tissue.

These observations, coupled with the fact that no marked difference in the incidence of signs of specific nutritional deficiencies could be found between the groups at any time, suggest that in children to whom a good diet is available malaria exerts its main effect on growth not by appropriating nutrients that would otherwise be used in building body tissue but by limiting the food intake of the host through the anorexia that the clinical attack produces.

The differences observed in the mean haematological indices, of which the erythrocyte concentration and the packed cell volume alone are significantly reduced in the malarious group, appear to be entirely due to malaria. Hookworm infection cannot have contributed to these differences, for not only was the density of infection low in each group, but the incidence of ankylostomiasis was twice as high in the protected as in the unprotected children.

Wilson and Miles (1946) state that there is conflict in the evidence that malaria tends to give positive reactions in the Kahn and allied serological tests. In the present investigation no positive reaction to the tests employed was obtained in the sera of the unprotected children despite the fact that all were fairly heavily infected. These children were, however, asymptomatic, and it is possible that had they been febrile positive reactions might have been obtained.

Within recent years considerable interest has been focused upon the question of whether malaria causes substantial enlargement of the liver (Colbourne *et al.*, 1950; McGregor and Smith, 1952; Waddy, 1952; McGregor, 1954; Black, 1954, 1955). The results reported above demonstrate clearly that such is indeed the case. They also show that hepatomegaly is attributable to the erythrocytic cycle of the malaria parasite, and that the pre- and exoerythrocytic cycles within the liver do not appear to influence the overall size of that organ. In view of the good nutritional status of the members of both groups malnutrition may be discounted as an additional factor in the production of hepatomegaly in these children. From clinical examination of the children showing liver enlargement no evidence of hepatic dysfunction could be adduced. The mechanism of enlargement and the associated histological changes will be discussed in a subsequent communication.

Of particular interest are the differences observed in mean serum protein values. It will have been noted that, whereas mean albumin levels were similar in both groups, mean total protein and globulin values were much higher in the un-

protected children. Analysis of electrophoretic patterns indicated that this difference was located principally in the serum gamma-globulin fractions. The precise reason for the existence of a much higher gamma-globulin level in the serum of the malarious children is not known, but when the controlled nature of the investigation is considered it is clear that malaria must have been at least a closely related factor. Study of the literature relating to serum protein changes in malaria reveals that most communications describe observations made during the acute attack. Observers have reported a fall in serum albumin and a rise in serum globulin with an overall reduction in total serum proteins (Fulton and Maegraith, 1949). These changes are transient, and protein values revert to original levels soon after eradication of the infection. It is apparent that, hitherto, little information has been gathered on the cumulative effects on serum proteins of several years of repeated and heavy plasmodial infection.

It is possible that almost three years of continued irritation of the reticulo-endothelial systems of the unprotected children by the products of disintegration of parasitized erythrocytes may have stimulated the production of abnormally large quantities of gamma-globulin. If this is so the high values obtained in the malarious children are of no special significance, since they have their origin in a non-specific process. However, it is equally possible that these high values may be caused, at least in part, by the production of specific humoral antibodies to the erythrocytic phase of the infecting plasmodium. The observations of earlier workers justify this hypothesis. Sotiriades (1936) reported that whole blood from highly immune subjects produced beneficial results when injected into patients suffering from acute attacks of malaria, while Coggeshall and Kumm (1937) and Eaton (1938) demonstrated the presence of circulating antibodies in the sera of monkeys recently recovered from malaria. At this juncture further speculation on the mechanism of the production of the serum protein variations recorded would be valueless, and additional investigations are clearly indicated.

The difference in the mean erythrocyte sedimentation rates of the protected and unprotected children must be regarded as a sequel to erythrocyte parasitization in the latter. The high mean rate observed in the treated group, however, is puzzling. As these children were all fit and well and presented no sign of disease save for a moderate degree of intestinal helminthic infection in some cases, one wonders what part the unsuppressed hepatic phases of malaria played in raising these sedimentation rates. McGregor and Deegan (1954) observed that the mean erythrocyte sedimentation rate in a group of fit and healthy Gambian adults, who must have experienced severe repeated malarial infection in infancy and childhood, was, by European standards, abnormally high. They postulated that a possible reason for this could be that Gambian adults possessed a plasma protein pattern which differed greatly from the accepted European normal. The results of this present investigation support that view and, further, incriminate malaria as a major factor in the production of the altered pattern.

The results of urinary examination and of the evaluation of serum non-protein nitrogen levels suggest that with one possible exception the prolonged heavy malaria infections experienced by the unprotected children caused no permanent impairment of kidney function. Even in the exceptional case the relationship of quartan malaria to proteinuria is obscure, and it is possible that the two conditions were completely independent.

After more than three years of continuous chloroquine dosage no evidence of drug toxicity was found in any protected subject. Throughout this period complete suppression of the erythrocytic cycle of malaria was achieved in every subject who received regular weekly treatment.

## Summary

To assess the effects of repeated heavy erythrocytic infection in African infants and young children an investigation in a hyperendemic malarial district of the Gambia began in 1951. Twenty-six infants were protected from birth by weekly doses of chloroquine base (6 mg. per kg. for the first two years and thereafter 150 mg.). A control group of equal size of unprotected infants from the same population was maintained. The established custom of infant feeding in a rural Gambian community was not modified. Members of both groups were examined regularly for three years.

The unprotected children once infected with malaria were observed to grow more slowly and to become much more anaemic than the protected children over the first two years. Mortality rates for protected and unprotected groups were 3.8% and 19.2% respectively, all deaths occurring in the first sixteen months. As increasing resistance to malaria was acquired the unprotected children made rapid growth progress.

In October–November, 1954, 16 protected and 13 unprotected children were admitted to hospital for detailed investigation and comparison. The mean weight of protected children at a mean age of 161.68 weeks was 464.50 oz. (13.167 kg.) and that of unprotected children at a mean age of 161.15 weeks was 466.15 oz. (13.214 kg.). The mean heights of protected and unprotected subjects were 35.82 in. (90.9 cm.) and 34.49 in. (87.6 cm.) respectively.

All unprotected children were found to exhibit malarial parasitaemia (plasmodial frequency being: falciparum 100%, malariae 61.5%, ovale 7.7%), but to be asymptomatic.

The nutritional status of members of both groups was assessed to be good, the incidence of deficiency signs in protected and unprotected children respectively being: skin changes 12.5% and 15.38%; bone changes 25% and 46.14%; mucosal changes 12.5% and 23.0%.

All unprotected children showed considerable hepatomegaly and splenomegaly, while 12.5% of protected children were found to have enlarged livers and 6.3% enlarged spleens.

Hookworm and ascaris ova were found in the stools of 68.8% of protected and 38.5% of unprotected children; the density of infection was greater in the unprotected group.

A marked proteinuria associated with a *P. malariae* parasitaemia was noted in a member of the unprotected group. No other gross urinary abnormality was detected in any child.

The differences detected in mean haematological indices between the protected and unprotected groups respectively were: E.S.R., 31.1 and 50.84; Hb, 11.28 and 10.88 g.%; R.B.C., 4,000,000 and 3,688,000; P.C.V., 34.37 and 31.96%; M.C.V. 86.25 and 86.92 cubic microns; M.C.H.C., 32.81 and 33.84%; W.B.C. 9,288 and 9,980; sickling trait, 12.5% and nil.

Chemical estimation of serum proteins showed the mean total serum protein (7.59 g.%) and mean globulin (3.76 g.%) values to be higher in unprotected than protected children (7.13 and 3.20 g.%). Mean albumin values were almost identical (3.92 g.% protected and 3.83 g.% unprotected), as were mean N.P.N. levels (20.85 mg. per 100 ml. protected and 19.07 mg. per 100 ml. unprotected). By filter paper electrophoresis the gamma-globulin fraction in unprotected children was found to be almost one-third greater than in protected children. The serum of only one subject, a protected child, yielded positive results in the Wassermann, cardiolipin Wassermann, Kahn, and treponemal immobilization tests.

The results are discussed and are considered to indicate that erythrocytic malaria in Gambian children exerts its main effects in the first two years of life, chiefly through the clinical illness produced by the acute attack. Malarious children, once they have acquired sufficient resistance to the noxious effects of clinical malaria, appear rapidly to make good lost ground despite the persistence of moderately dense parasitaemia. A consistent relationship between hepatomegaly and erythrocytic malaria is defined. The view is expressed that the serum protein changes observed in malarious children may in part be due to the formation of humoral antibodies.

We wish to thank Dr. S. H. O. Jones, Director of Medical Services, Gambia, for his assistance throughout this investigation; the nursing sisters of the Gambia Health Services and of the Medical Research Council for their invaluable and continuous co-operation; and Dr. I. N. O. Price, of the Public Health Laboratory Service, for conducting the serological tests reported in this paper.

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# STUDY OF TRANSFUSED PLATELETS IN A CASE OF CONGENITAL HYPOPLASTIC THROMBOCYTOPENIA

BY

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The following case of neonatal thrombocytopenia is of interest because of the rarity of the haematological disorder, which was apparently a primary aplasia of the megakaryocytes associated with a congenital skeletal defect of the forearms, and also because it was possible to give relatively large transfusions of platelets in view of the recipient's small blood volume. In the virtual absence of platelet production in the infant, the effectiveness and survival of these transfused platelets could be readily studied.

## Case History

This child, a female, was born at term of the mother's second pregnancy. Its weight was 6 lb. 2 oz. (2,780 g.). The first pregnancy had miscarried at two months. Vaginal bleeding had occurred also in this pregnancy during the twelfth week. No consanguinity existed between the parents, who were in good health.

The infant was born with a deformity of both arms, due to the absence of both radii, resulting in diminutive forearms with abducted hands, but otherwise appeared healthy. Progress was uneventful until the sixth week, when melaena occurred, immediately followed by the appearance of scattered petechiae and noticeable pallor. No drug with which blood dyscrasia could be associated had been given at any stage of the child's illness.

The infant was admitted to hospital on June 11, 1955, aged 6 weeks and weighing 7 lb. 7 oz. (3,370 g.). Nutrition and hydration were good. The child was alert and afebrile, but there was marked pallor with petechiae in the mouth and skin. The liver was palpable and enlarged. The spleen could be felt ½ in. (2 cm.) below the costal margin. No lymphadenopathy was apparent. No other abnormality was found on physical examination. The urine was normal.

*Investigations on Admission.*—Hb, 5 g. per 100 ml.; white cells, 63,000 per c.mm., with a preponderance of granular cells and a marked shift to the left (for differential count, see Table I). The red cells showed frequent polychromatic forms and normoblasts. Blood group B, rhesus test positive (to anti-D), direct Coombs test negative. Platelet count

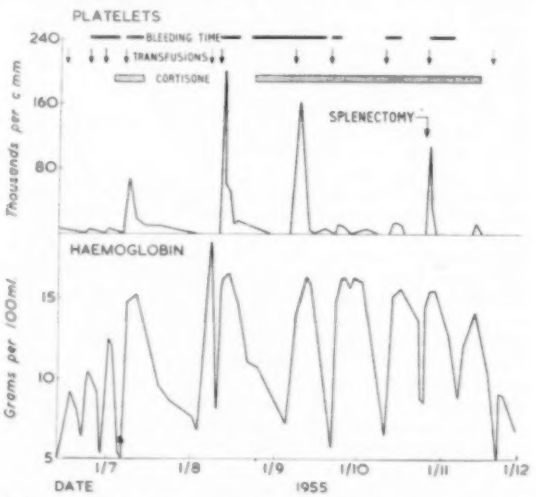


FIG. 1.—"Platelet transfusions" are indicated by arrows, and transfusions of stored blood by dotted arrows. The duration of a normal bleeding-time is shown by a continuous black line; where this is interrupted the bleeding-time was found to be longer than 10 minutes.

(Fonio's method), 3,600 per c.mm. Bleeding-time in excess of one hour. Clotting-time, clot retraction, and prothrombin times were within normal limits. Hess's test showed 15 petechiae in ½ square inch (3.2 square cm.). Serum bilirubin, 0.4 mg. per 100 ml. Tibial marrow counts (Table I) showed a normoblastic hyperplasia, active leucopoiesis, and a striking absence of platelet precursors. Prolonged search of several films from each specimen failed to show any mature or early forms of megakaryocytes. A maternal blood count was normal, with a normal platelet count. The Wassermann reaction in the mother and child was negative.

After admission a tentative diagnosis of congenital hypoplastic thrombocytopenia was made, based on the absence of platelet precursors, the haematological condition being associated with skeletal abnormalities.

On June 14 a transfusion of stored blood was given. In spite of a satisfactory rise in haemoglobin there was no appreciable effect on the bleeding-time or the platelet count, and the stools continued to be heavily blood-stained. In view of the thrombocytopenia, platelet transfusions were given (for technique, see Appendix). The improvement on each occasion was striking but transitory (Table II). Clinically, there was fading of petechiae, and the stools changed from melaenic to normal. The increased number of circulating platelets persisted for as long as five days, while the bleeding-time and the capillary fragility were found to be normal for a longer period (see Fig. 1).

TABLE I.—*Blood and Bone-marrow Findings*

| | Blast Cells | Premyelocytes | Neutrophil Myelocytes | Neutrophil Metamyelocytes | Segmented Neutrophils | Lymphocytes | Monocytes | Plasma Cells | Proerythroblasts | Early Normoblasts | Intermediate Normoblasts | Late Normoblasts | Megakaryocytes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Marrow Counts (%) | | | | | | | | |
| 14.6.55 | 6·0 | 3·5 | 13·0 | 10·5 | 24·5 | 8·0 | — | — | 1·5 | 13·0 | 14·0 | 6·0 | None seen |
| 1.7.55 | 5·2 | 6·8 | 16·0 | 14·0 | 28·0 | 18·4 | 3·2 | — | 0·4 | 2·0 | 2·8 | 3·2 | ,, ,, |
| 23.9.55 | 3·6 | 4·4 | 15·8 | 15·4 | 24·0 | 24·8 | — | — | 0·4 | 1·6 | 7·6 | 2·4 | ,, ,, |
| 2.12.55 | 4·4 | 3·2 | 19·2 | 9·6 | 21·2 | 18·8 | 1·6 | 0·4 | 0·4 | 1·2 | 10·8 | 13·2 | ,, ,, |
| | | | | | Pre-transfusion Blood Counts (%) | | | | Normoblasts per 100 W.B.C. | | | Total W.B.C. | |
| 13.6.55 | 2·5 | 5·0 | 30·0 | 7·0 | 34·5 | 14·0 | 6·5 | 0·5 | 9 | | | 63,800 | |
| 2.8.55 | — | — | 5·0 | 4·0 | 43·0 | 33·0 | 15·0 | — | — | | | 20,100 | |
| 10.10.55 | — | — | 2·5 | 0·5 | 53·5 | 39·0 | 4·5 | — | (Reticulocytes 5·6%) | | | 18,800 | |
| 1.11.55 | — | — | 1·0 | — | 64·0 | 30·0 | 5·0 | — | — | | | 19,800 | |
| 9.11.55 | 2·0 | 1·0 | 1·0 | 7·0 | 48·0 | 34·0 | 6·0 | 1·0 | 28 | | | 131,000 | |
| 1.12.55 | — | — | — | 1·0 | 50·0 | 44·0 | 5·0 | — | 12 | | | 36,300 | |

TABLE II

| Date | Volume of Blood | Platelet Content (per c.mm.) | Expected Rise (per c.mm.) | Actual Rise (per c.mm.) | Duration of Normal Bleeding-time |
|---|---|---|---|---|---|
| 14.6.55 | 150 ml. (stored) | Nil | Nil | Nil | Nil |
| 23.6.55 | 110 ,, (fresh) | — | — | 3,300 | 5 days |
| 29.6.55 | 250 ,, ,, | 100,000 | 75,000 | 21,000 | 3 ,, |
| 7.7.55 | 270 ,, ,, | 195,000 | 146,000 | 65,000 | 4 ,, |
| 6.8.55 | 200 ,, (stored) | Nil | Nil | Nil | Nil |
| 11.8.55 | 220 ,, (fresh) | 490,000 | 270,000 | 206,000 | 4 days |
| 9.9.55 | 350 ,, ,, | 536,000 | 430,000 | 150,000 | 12+ ,, |
| 24.9.55 | 350 ,, ,, | 113,000 | 84,000 | 12,000 | 4 ,, |
| 13.10.55 | 350 ,, ,, | 156,000 | 107,000 | 12,000 | 4 ,, |
| 26.10.55 | 400 ,, ,, | 668,000 | 486,000 | 104,000 | 8+ ,, |
| 24.11.55 | 270 ,, (stored) | 220,000 | — | — | Nil |

In addition to treatment with transfusion, cortisone was given by mouth. Therapy was begun with a dosage of 7.5 mg. daily, which was gradually increased to an ultimate dose of 24 mg. daily. Some control of the bleeding tendency appeared to be produced, as shown by improvement in tests of the bleeding-time and capillary fragility. There was no effect on the platelet count. In spite of anaemia the general condition of the child remained good, with satisfactory developmental progress (see Fig. 2, taken on October 11), and a slow weight gain from 7 lb. 7 oz. (3,370 g.) on admission to 14 lb. 3 oz. (6,435 g.) at death six months later.

After a poor response to two platelet transfusions, splenectomy was carried out on October 26. At operation the spleen was found to be slightly enlarged (weight 21 g.). Microscopy showed abundant splenic follicles with a simple pulp hyperplasia. There was no evidence of leukaemia, vascular lesions, or other abnormality apart from mild siderosis. As a pre-operative measure a particularly large platelet transfusion was given. There was no undue bleeding at the time of operation or during the post-operative period; wound healing was satisfactory, only superficial petechiae occurring at the operation site. Transfused platelets survived for three days. Nineteen days later, however, platelets appeared spontaneously, in small numbers, for the first time, preceded by the appearance of large numbers of normoblasts (28 per 100 white cells), together with reticulocytes (16.8%), and followed by a rapid rise in haemoglobin. The improvement was not maintained. Four days after an emergency transfusion of stored blood the haemorrhagic state became more marked; the infant developed signs of cerebral haemorrhage and died on December 2.

FIG. 2.—Showing the deformity of the forearms and degree of enlargement of the liver.

At necropsy an extensive cerebral haemorrhage was found. Absence of the radii was confirmed by dissection, no bony rudiment being demonstrable. Microscopy of the liver (weight 240 g.) showed small foci of haemopoietic tissue within the sinusoids. The lymph nodes generally were moderately enlarged, and microscopically showed similar haemopoiesis within the sinuses. A sample of bone marrow taken three hours after death showed a hypercellular, actively normoblastic marrow. Megakaryocytes were not seen in these films, nor in subsequent bone-marrow sections. Small haemorrhages were present in the lungs, myocardium, meninges, and brain. The haemopoietic activity was considered to be in keeping with compensatory blood formation following continued bleeding.

## Diagnosis

Thrombocytopenia in the neonate is an uncommon condition. A comprehensive review of such cases is given by Robson and Walker (1951). They classify congenital and neonatal thrombocytopenia into those cases in which there is a maternal history of purpura and those from normal mothers. In the latter category they distinguish transient idiopathic thrombocytopenic purpura, in which hyperplasia of the megakaryocytes is the usual finding, from other cases in which there is an aplasia of the megakaryocytes in the bone marrow. The earliest reference to this latter condition is that of Greenwald and Sherman (1929). Two further cases have been recorded (Landolt, 1948; Stefanini and Dameshek, 1955). In each of these cases the child had one or more congenital deformities associated with hypoplasia of the megakaryocytes. The case of Stefanini and Dameshek appears remarkably similar to our own, since the hypoplasia of the megakaryocytes was associated with a congenital absence of both radii.

It is significant in this case that the mother's blood picture was normal, and that she gave no history suggestive of a haemorrhagic diathesis. There was a history of threatened abortion at the second month. It is at about this time in intrauterine life that platelet production is thought to begin (Fruhling *et al.*, 1949). In addition, there was no evidence of secondary thrombocytopenia in the infant arising from such causes as acute infection, drugs, or leukaemia. The fall of haemoglobin associated with the presence of normoblasts in the peripheral blood raised the possibility of a haemolytic anaemia, which was excluded by the absence of jaundice, normal serum bilirubin, and the negative Coombs test. Aplastic anaemia associated with skeletal defects of the type described by Fanconi (1927) could be excluded by the bone-marrow findings, the high white cell count, and the absence of other features such as cutaneous pigmentation and microcephaly. It is suggested that this is a case of primary congenital aplasia of the megakaryocytes associated with other congenital deformities, as referred to by Hauser (1948).

### Platelet Transfusion

Platelet transfusions may be given by a variety of techniques, all based on preventing platelets adhering to wettable surfaces. Duke (1910) reported the first successful platelet transfusion, but gave no details of his technique. Hirsch *et al.* (1950) succeeded in raising the platelet count of a case by using silicone-coated syringes and needles. Recently, with the development of plastic materials, it has been possible to use non-wettable tubing for continuous transfusion rather than the multiple-syringe technique used by Hirsch and Gardner (1952) and Stefanini and Dameshek (1953). The latter authors reviewed other methods of obtaining platelet suspensions. These included the use of dextran, the collection of platelets on columns of ion-exchange resin, or the centrifuging of blood at low temperatures to remove red and white cells. They concluded that the manipulations necessary for these methods so impaired the survival of platelets after transfusion that they defeated their own purpose. The method adopted here is both simple and convenient (see Appendix).

We confirm the striking decrease in haemorrhagic manifestations, bleeding-time, and capillary fragility which has been reported by other workers, notably Duke, Hirsch, and Dameshek. Besides the use of platelet transfusions in the present case, stored blood and cortisone were given (see Fig. 1). Stored blood did not have any appreciable effect on the haemorrhagic state or on the maintenance of haemoglobin. This is illustrated by the transfusion given initially and that given on August 6. After the latter transfusion the haemorrhagic diathesis became so marked, with generalized petechiae, bleeding gums, and the passage of bright red blood in the stools, that the haemoglobin fell from 18.5 to 8.5 g. per 100 ml. in three days. This state was arrested by a transfusion of fresh blood containing 490,000 platelets per c.mm., with an improvement of the capillary fragility to normal, and a reduction of the bleeding-time to within normal limits. These effects lasted for four days, after which no platelets could be found in the infant's blood. Eight such "platelet transfusions" were given, including three from a donor with a platelet count of approximately 1,000,000 per c.mm., followed by a similar improvement on each occasion. It can be seen from Fig. 1 that, irrespective of the number of platelets present in the infant's blood immediately following transfusion, the survival of significant numbers of transfused platelets in the circulation remained the same (from four to five days).

Some platelets presumably disappear during the first few hours, being used to control capillary haemorrhage. It is interesting to speculate on the mechanism for the removal of the remainder, since it has been observed by us, and by Mustard (1956), that platelets can be stored in acid citrate–dextrose mixtures at 4° C. for periods of at least three weeks. Tullis (1953) has shown that platelets can be stored in special media for longer periods than either red or white cells.

Blood containing 220,000 platelets per c.mm. at the time of transfusion, in which the platelets had a normal morphological appearance and staining properties in spite of storage in a siliconed container for four weeks, was used on November 24. No platelets were demonstrable in blood samples taken from the infant immediately after this transfusion. We conclude that platelets whose staining and morphological appearance are normal are not necessarily viable. For the administration of viable platelets, freshly taken blood is essential.

On each occasion that platelets were transfused, an estimate of the expected rise was made, based on the platelets present in the blood passing through the needle to the infant and the assessment of the infant's blood volume derived from its weight—reckoning a blood volume of 40 ml. per lb. (Russell, 1949). It was noticed that in the later transfusions the difference between the actual platelet count performed on the infant and the expected level was becoming greater. From Table II it can be seen that in the initial platelet transfusions yields of between 30 and 70% were obtained. These figures are similar to those recorded by Hirsch and Gardner (1952). These yields fell to a level of only 10% prior to splenectomy. Following the transfusion on October 13 the platelet survival time became shortened, and subsequent studies revealed the presence of a platelet antibody. Serum taken on October 20 showed a titre of 1/16 with compatible platelets, and a sample taken terminally on December 2 showed a titre of 1/8, using the technique described by Stefanini *et al.* (1953).

The low titre of antibody in this case and its failure to rise in spite of repeated platelet transfusion might be accounted for by the immaturity of antibody-producing mechanisms in the neonatal period. Cortisone possibly also impaired antibody production. Unfortunately, antibody was not looked for in the serum on admission, but the clinical course and the persistence of thrombocytopenia and antibody make transplacental transfer of antibody from the mother extremely unlikely in this case.

Splenectomy was undertaken as a last resort, since after two months' treatment, including cortisone, there had been no sign of autogenous platelet production, and the frequency of transfusions was increasing. We were influenced also by the case reported by Stefanini and Dameshek (1955), in which splenectomy was followed by a rise in the platelet count to normal numbers. In the present case, although platelets returned in small numbers a fortnight after splenectomy, the improvement was only transitory.

Hirsch and Gardner (1952), in discussing the largest series of platelet transfusions recorded, pointed out that, of 42 transfusions given, only one failed to produce clinical improvement, and in this case there was no rise in platelets. We agree that haemorrhagic manifestations in states of thrombocytopenia can be dramatically arrested, but this effect is only transient, depending apparently upon the survival of the platelets. This method of treatment has the limitation that if repeated, especially in adults, sooner or later the platelet survival time becomes shorter owing to the production of a platelet antibody. We suggest that it is well worth while to administer fresh blood from siliconed containers through plastic tubing to cases with thrombocytopenia, in order to tide them over acute haemorrhagic episodes or operative procedures such as splenectomy.

### Summary

A case of congenital hypoplastic thrombocytopenia associated with other congenital defects is described with post-mortem findings.

Similar cases are briefly reviewed and the differential diagnosis is considered.

The progress and treatment with platelet transfusions, cortisone, and splenectomy are described and discussed.

Repeated platelet transfusions have been found to be of value and a simple technique is outlined.

Information regarding the survival of platelets *in vivo* and *in vitro* following transfusion has been obtained.

The value and limitations of platelet transfusion are discussed.

### APPENDIX: METHOD USED FOR PRESERVING PLATELETS

Blood for transfusion was taken from fasting donors with a wide-bore needle direct into a known volume of acid-citrate–dextrose solution in a siliconed glass bottle calibrated in cubic centimetres. The bottles were prepared by coating the inside with silicone fluid D.C. 550 diluted with ether 1 in 2. The bottles were rinsed with several changes of glass-distilled water, dried in the incubator, and sterilized by autoclaving at a pressure of 20 lb. per square inch (1.4 kg. per square cm.) for 30 minutes. The blood on each occasion was then administered within one hour by scalp-vein transfusion through a short length—about 2 feet (60 cm.)—of "polythene" tubing. Transfusions were given rapidly at the rate of 40–50 ml. an hour. By these methods it was anticipated that the loss of platelets in the transfer of blood from donor to recipient would be reduced to a minimum.

We thank Professor W. St. C. Symmers and Dr. J. Shore, of the Department of Morbid Anatomy, Charing Cross Hospital, for the histological and post-mortem reports on this case; Dr. David Stone for collaboration with the platelet transfusions; and Mrs. P. E. Rivers for technical assistance.

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# PULMONARY OEDEMA DUE TO ANGIOCARDIOGRAPHY

## TREATMENT WITH INTRAVENOUS HYDROCORTISONE

BY

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Serious reactions to contrast media containing iodine are a not uncommon sequel to angiocardiography. Dotter and Jackson (1950) reported 26 deaths out of a total of 6,824 investigations, an incidence of 0.38%. Respiratory difficulty, respiratory arrest, or pulmonary oedema occurred in 12 of the fatal cases. McAfee (1955) reported eight deaths in a series of 732 angiocardiographies. He found that patients with primary pulmonary hypertension and pulmonary stenosis appeared to be especially liable to develop serious reaction. Two deaths were reported following selective angiocardiography: in one patient, with multiple pulmonary arteriovenous aneurysms, 35 ml. of a 70% solution of diodone was injected through a catheter in the right atrium; the patient died from acute pulmonary oedema after twenty-five minutes.

We report below the case-history of a patient who developed fulminating pulmonary oedema after the injection of sodium acetrizoate into the pulmonary arteries.

### Case Report

A man aged 39 had been well until a brief attack of unconsciousness during a strenuous game of football thirteen years previously. After this episode he became slightly breathless on exertion. He had a further syncopal attack, again precipitated by exertion, seven years ago. After a herniorrhaphy in January, 1955, he developed pulmonary infarction. There had been no other history of chest illness. He was admitted for investigation in November, 1955. On examination there were signs of pulmonary hypertension: a dominant "a" wave in the jugular pulse, an early ejection sound at the pulmonary area, and an accentuated pulmonary component of the second heart sound. The electrocardiogram showed right bundle-branch block. The chest *x*-ray picture showed moderate dilatation of the main branches of the pulmonary artery, with narrowing of the peripheral vessels.

The differential diagnosis included primary pulmonary hypertension, chronic thrombo-embolic pulmonary hypertension, and Eisenmenger's syndrome. Cardiac catheterization confirmed the presence of pulmonary hypertension. The pulmonary artery pressure was 90/20 mm. Hg, and the pulmonary vascular resistance was 10 units. The brachial arterial oxygen saturation was 91%. There was no direct or reversed shunt at any level. Selective angiocardiography was then performed to see whether any large pulmonary vessels were occluded. Promethazine hydrochloride, 25 mg., had been given one hour previously. A test dose of 1 ml. of sodium acetrizoate was injected through the catheter into the pulmonary artery. As there was no reaction, 15 ml. was injected into the left pulmonary artery, and a film taken. Then 20 ml. was injected into the right pulmonary artery and a further film taken.

At 11.15 a.m., forty-five minutes after the injection, the patient complained of nausea, and became dyspnoeic and slightly cyanosed. He also coughed up small amounts of frothy blood-stained sputum. He was given 50 mg. of diphenhydramine hydrochloride by mouth, but his condition became steadily worse. By 12.30 p.m. he was very distressed and breathless, and fine crepitations due to acute pulmonary oedema were widespread. He was transferred to a "cardiac" bed, venous cuffs were applied to the thighs, and he was treated with morphine, adrenaline, aminophylline, and oxygen without benefit. At 2 p.m. 25 mg. of promethazine hydrochloride and 200 mg. of cortisone were given intramuscularly. Oxygen was bubbled through 45% ethyl alcohol in a fruitless attempt to reduce the frothiness of the sputum. His condition progressively deteriorated, and he developed signs of extreme peripheral vasoconstriction, with an unrecordable blood pressure. He became increasingly drowsy, and by 4 p.m. he was unrousable; his upper respiratory tract was choked with profuse frothy sputum which he was unable to expectorate. Death appeared to be imminent.

At this stage, laryngoscopy was performed by direct vision and a considerable amount of sputum aspirated; this brought slight improvement. An intravenous injection of 5 ml. of nikethamide caused the patient to recover consciousness and expectorate a large amount of frothy sputum. He then gradually relapsed into coma. Thirty minutes later, at 4.45 p.m., a further dose of nikethamide produced a similar result. Then from 5 to 6.30 p.m. he was given an intravenous infusion of 100 mg. of hydrocortisone (free alcohol) in 500 ml. of isotonic saline. During this time his condition steadily improved, his breathing became less distressed, and he recovered consciousness. There were fewer rales in his chest. When 5 ml. of nikethamide was given intravenously at 5.45 p.m. he produced much less sputum than after the previous doses. At 6.30 p.m. the hydrocortisone was stopped, and a slow drip infusion was continued with isotonic saline alone; 25 mg. of promethazine hydrochloride was given intramuscularly. At 10 p.m. pulmonary oedema recurred and responded again to an infusion of hydrocortisone, which was continued until 1.30 a.m. At 3 a.m. a second relapse occurred, and the signs of pulmonary oedema diminished within five minutes of starting the third hydrocortisone infusion. This was maintained for three hours, and thereafter his condition remained satisfactory.

Oral cortisone was subsequently given in gradually decreasing doses for nine days. During this time he was pyrexial, and developed signs of consolidation of the apical segment of the right lower lobe; this was confirmed by radiography, and attributed to pulmonary infarction.

### Discussion

Of the 26 deaths reported by Dotter and Jackson (1950), sensitivity tests were performed in 19 cases and were negative. Yet the intravenous injection of 1 ml. of solution of diodone has itself caused death in four instances (Morgan, 1950; McAfee, 1955). In the present case, generalized pulmonary oedema must be attributed to a hypersensitivity reaction of

which no warning had been given from a preliminary test dose injected into the pulmonary artery. It is concluded that the administration of a test dose of contrast medium is an unreliable method of detecting hypersensitivity, and may in fact induce a false sense of security.

The treatment of the condition presented a difficult problem. As might have been expected, the methods of treatment applicable to pulmonary oedema occurring in left ventricular failure were ineffective here. Intravenous hydrocortisone, on the other hand, appeared to exert a specific and prolonged anti-allergic action in reducing pulmonary oedema. The anthistamine drugs proved of little value. Nikethamide was useful in reviving consciousness and the cough reflex so that fluid could be expectorated.

Intravenous hydrocortisone induced immediate improvement on three separate occasions, and undoubtedly saved this patient's life. Intramuscular cortisone, which was given initially, was presumably ineffective owing to poor absorption in the presence of severe peripheral vasoconstriction. The use of intravenous hydrocortisone in overwhelming allergic reactions is a rational therapeutic measure, and the present case history confirms its usefulness. Our experience indicates that the drug should be immediately at hand in all centres employing the intravenous injection of contrast media.

**Summary**

A case of gross pulmonary oedema following selective angiocardiography in a patient with primary or chronic thrombo-embolic pulmonary hypertension is reported. Recovery was clearly attributable to prolonged intravenous infusion of hydrocortisone. A test dose of sodium acetrizoate failed to provide warning of hypersensitivity.

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# FREQUENCY IN THE FEMALE DUE TO URETHRO-TRIGONITIS CAUSED BY INTESTINAL INFECTION

BY

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In his Hunterian Lecture of 1933 Winsbury-White proved by means of injected animal specimens that infection of the genital organs in the female caused marked pathological changes in the urethra and trigone of the bladder. This fact had been readily accepted as occurring in the male as a result of the anatomical relation of the prostate to the bladder neck, but it was not recognized as occurring so readily in the female. By the routine use of a urethroscope, characteristic changes at the bladder neck were found to be invariably associated with disturbances of micturition.

This is the original work which established urethro-trigonitis as a clinical entity and the commonest condition found in female patients attending a urological clinic, but, as Winsbury-White (1947) states, chronic urethro-trigonal changes are not uncommon in women with healthy cervices. And it is not uncommon even in patients who had had the genital organs removed some time prior to the onset of the urethro-trigonitis.

### General Review of Urethro-trigonitis in the Female

In a review of female patients suffering from urethro-trigonitis and attending a urological clinic over the last seven years it was found that the incidence of this condition was remarkably constant from year to year, varying only between 25 and 30% of the total female attendances of 453. The majority of cases occurred between the ages of 30 and 50, but it might occur in any of the age groups. The most common symptom was frequency of micturition, which was pronounced in 80% of the patients. Dysuria was present in 50%, as was urgency of micturition. In spite of the old teaching that residual urine is rare in the female, an intravenous pyelogram in all cases revealed that 66% of these cases had a definite volume of residual urine left after micturition. The laboratory reported that 16% of the catheter specimens taken as a routine contained pus cells and that organisms were present in only 12%, the predominant organism being *Bact. coli*. Winsbury-White states that urethro-trigonitis is a predisposing cause of *Bact. coli* infection of the urinary tract, and that it does not produce such an infection by itself but only by causing conditions which favour the onset of infection by reason of obstruction of the bladder neck. The diagnosis was made by routine examination with a urethroscope, and characteristic changes in the urethra and bladder neck were noted in every case. The cervix was examined as a routine, and an erosion or evidence of cervicitis was present in 66% of cases; of the remainder there was no evidence of genital infection.

In each case the internal sphincter was dilated as a result of the urethroscopic examination, and dilatation was repeated in accordance with Winsbury-White's method at not less than six-weekly intervals and to a dilatation not greater than F.28. In 25% treatment was speeded up by fulguration of the polypi and granulations and hillocks: 66% were cured and 28% much improved.

### Urethro-trigonitis Not due to Infection of Genital Tract

There remain, therefore, 34% of cases in which no infection of the cervix or genital organs can be found to account for the pathological changes in the urethra and trigone.

In a number of patients an association between the large intestine and the neck of the bladder had been noticed: the first instance was that of a patient in whom an acute attack of diverticulitis of the sigmoid colon followed each dilatation of the urethra and in whom marked urethro-trigonal changes had been found on urethroscopy. On further inquiry the patient stated that when she had an attack of diverticulitis the symptoms of urethro-trigonitis were very much worse.

A frequent complaint in these patients is of discomfort and even pain in the left iliac fossa, which may be associated with some irregularity of the bowels. On abdominal palpation there is not infrequently definite tenderness over the sigmoid and pelvic colon, which may in some patients be palpable.

Out of 43 cases examined radiologically by means of a barium enema, 11 showed lesions of the large intestine which were closely related to symptoms of urethro-trigonitis verified by urethroscopy. Of the 11 cases, 8 showed numerous diverticula of the lower colon with radiographic appearances strongly suggesting inflammatory changes in the surrounding bowel. Two patients had been previously diagnosed as having diverticulitis with rigidity and thickening of the sigmoid colon. In one case a barium enema showed a carcinoma of the recto-sigmoid junction though there had been no initial symptoms suggesting a neoplasm of the bowel but only those of urethro-trigonitis.

Chronic constipation was not accepted as a likely cause of urethro-trigonitis, as it does not of itself produce inflammatory changes in the wall of the bowel; nor were lesions of the anal canal included as a cause, although on anatomical grounds there would seem to be no reason why they might not form a source of infection.

In the absence of animal experiments, which made Winsbury-White's work so conclusive, a study of the relationship of the lymphatics of the lower part of the large intestine with those surrounding the bladder neck, although

not showing such a close relationship as that of the cervix to the floor of the bladder, nevertheless shows a ready lymphatic connexion. This is well shown by Rouvière (1932), and there would seem to be no reason why infection should not spread from the lymphatics of one organ to those of the other, which would appear, on clinical grounds, to be the case.

The results of treatment of the bowel condition combined with that of the bladder neck go far to support this theory. Dilatation of the bladder neck and even fulguration of polypi and granulations have not produced very encouraging results in such cases, but when the lesion of the bowel is alleviated the urethro-trigonitis responds to treatment very much more readily. Thus the bladder neck was treated in exactly the same way as when the infection came from the cervix, care being taken not to irritate the urethra by too frequent dilatation—that is, not more than once every six weeks and usually at less frequent intervals.

Treatment of the bowel depends on the type of lesion and its extent. In the less extensive lesions, in which surgery is not called for, the institution of a low residual diet which does not irritate the mucosa of the bowel and limits fermentation, combined with regulation of bowel action by "petrolagar" with or without phenolphthalein, alone may give much improved results, but infection can be further limited by the administration of phthalylsulphathiazole in an initial dose of six 0.5-g. tablets followed by two tablets every six hours for fourteen days. This course can be repeated at fortnightly intervals until the infection has been greatly diminished. (In the more resistant cases an initial course of streptomycin and sulphaguanidine followed by phthalylsulphathiazole may be necessary.) As a result of this routine the symptoms of urethro-trigonitis were improved in each of the cases treated.

**Summary**

Symptoms of urethro-trigonitis were present in 25 to 30% of female patients attending an out-patient clinic, and this condition was verified by urethroscopy in which characteristic changes were found present at the bladder neck. These changes have been proved to arise from lesions of the cervix and genital tract, and were found in 66% of these cases. Of the remaining 34%, a third were found to have radiologically demonstrable lesions of the large intestine. Treatment of the intestinal infection, combined with dilatation and, where necessary, fulguration of the bladder neck, gives excellent results as compared with dilatation and fulguration alone.

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The Ministry of Education on September 13 asked local education authorities to review their arrangements for providing primary and secondary education for children in hospital and to see that they are as comprehensive as possible. Though much has been done, the Ministry claims that "there are still some educable children in hospital for whom no provision has been made." This may be provided either by teachers visiting or by setting up hospital schools. In 1955 there were 120 hospital schools in England and Wales, with 6,476 children on the roll; 1,425 other children were receiving individual tuition. Where there is no hospital school or regular teaching group, the Ministry of Health has asked hospitals to inform education authorities about the admission of any child likely to remain in hospital who is yet well enough to have some lessons. The circular calls for a good supply of library books, commenting: "Reading matter given by well-intentioned visitors may not always be suitable or adequate."

# ACCIDENTAL CARBON MONOXIDE POISONING

## DANGERS OF INADEQUATE VENTILATION

BY

**F. S. FIDDES, M.D.**

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Of late there have been frequent expressions of concern at the increasing number of deaths from accidental coal-gas poisoning. A high proportion of such accidents are associated with various predisposing or contributory conditions in the victim, which have been described collectively as "the 4 D's of accidental carbon monoxide poisoning"—the decrepit, the diseased, the drugged, and the drunk. Others are caused by faulty appliances or by ill-advised amateur adaptations, and occasionally responsibility can be traced to defects in gas-pipes or joints which are actually outside the premises occupied by the victims.

The danger of coke braziers and coke-burning stoves is well known, but deaths still occur from these sources, through either ignorance or disregard of warnings. It is insufficiently appreciated, however, that even coal-burning stoves and fires may be dangerous in certain circumstances, and that gas-fires and other appliances, though free of defects in themselves, may also be a source of danger if the conditions do not ensure free and complete combustion of the coal-gas. The following cases, resulting in the deaths of three healthy adult males, illustrate the circumstances in which fatal poisoning from such sources may arise, and point to the need for a greater awareness of the potential danger.

### Case 1

A man aged 50, employed as watchman on a building site, was in the way of spending part of the night asleep in a workmen's hut, and one morning he was found lying dead on the bunk with which the hut was fitted. The post-mortem appearances, external and internal, pointed to death from carbon monoxide poisoning, and the blood contained 55% carboxyhaemoglobin. There was no other significant finding at necropsy, apart from recent pleural adhesions over the left lung and older adhesions over the right lung. The man had recently resumed work after several weeks in hospital suffering from pneumonia.

The hut was of the wheeled type, adapted for towing, and the door at the rear was divided horizontally into two parts, upper and lower. There were two small windows, each capable of being opened. Inside the hut there was a fixed stove, with a chimney leading out through the roof. The capacity of the interior of the hut was approximately 600 cubic feet (17 cubic metres). On the night in question, which was very cold with a gusty wind blowing, both halves of the door had been closed and only one of the windows was slightly open. A fire had been burning in the stove, and this had apparently been well stoked before the man lay down to sleep. There was also an oil-lamp burning.

It was quite certain that no coke had been used in the stove, the only fuel available being coal of normal household quality. The stove and chimney were in good condition, without obvious defects. In these circumstances it was thought desirable to confirm the possibility of a lethal concentration of carbon monoxide having accumulated in the hut, and with this in view a fire of the same coal was lit in the stove and allowed to burn for about one and a half hours. The stove had previously been cleared of ashes and the fire burned freely. One window was slightly open. Samples were then taken of the flue (chimney) gases, with

the hut door open and closed, and also of the air above the stove, with the following results :

CO in flue gases (hut door open) ..... 980 parts per million
CO in flue gases (hut door closed) ..... 1,460 " " "
CO in air above stove (hut door closed) .. 310 " " "

The increase in the CO content of the flue gases on closing the door is marked, and clearly indicates inadequate ventilation, with consequent impaired combustion. The CO content of the air above the stove is significant, for, on the day of sampling, the down draught was only very slight and intermittent. It is obvious that with the door shut, and with frequent short periods of down-draught such as would occur in windy weather, a lethal concentration would accumulate quite rapidly in such a relatively small space. The time of exposure of any occupant would not require to be greatly prolonged before a fatal result ensued.

### Cases 2 and 3

Two men, aged 31 and 32, booked lodgings for the night and retired to their bedroom about 9 p.m. In the morning the bedroom door was found locked, and, as no response was obtained to repeated knocking, entry was eventually obtained by a window, and the two men were found dead in bed. The gas-fire in the room was burning, apparently satisfactorily, but both men had died from carbon monoxide poisoning, the blood in each case showing a concentration of 72% carboxyhaemoglobin. The necropsy revealed no other feature of significance.

A washed nylon shirt and other garments were found hung up in front of the fire as if to dry, and it appeared that the fire had been lit by the men before retiring and had burned all night. The door of the room was fitted with a draught excluder, the window had been closed and the curtains were drawn. The capacity of the room was slightly less than 1,100 cubic feet (31 cubic metres) and the atmosphere in the room in the morning was very hot, dry, and oppressive, almost like an oven, although there was no strong or obvious smell of coal-gas.

The gas-fire stood in a tiled fireplace from which a long flue or chimney led to the exterior. There was some blackening of the tiles above the fire, and the chimney was found to be partially choked. The gas-fire consisted of seven elements or radiants, and, although these were broken in places, the flames appeared satisfactory and combustion complete. There was no defect in the gas-tubing or joints.

After the fire had been allowed to burn for about half an hour with the door and window closed, however, there was noticeable lengthening of the inner cones of the flames, indicating incomplete combustion. The sequence of events leading to the deaths was fairly certain. The exclusion of air entry into a room of small dimensions had resulted in insufficient oxygen for complete combustion, and the choked chimney had caused spilling of the products of incomplete combustion back into the room. Although the actual rise of CO concentration was not determined, it is obvious that a potentially lethal concentration would be quickly achieved in such a relatively small room, and the sleeping occupants would remain quite unaware of the increasing danger.

### Conclusion

These fatal cases of accidental carbon monoxide poisoning provide a timely reminder of : (1) the danger of using stoves in confined spaces, *even though these are in good order and fuelled with good quality coal*, unless adequate positive ventilation is ensured at all times, whether the doors or windows be closed or not ; and (2) the danger which may arise from gas-fires, *even if these and their fittings are in perfect order and they appear to be burning satisfactorily*, if there is not also adequate ventilation and extraction of the combustion products.

I am indebted to Dr. E. A. C. Chamberlain, of the Scientific Department of the Scottish Division of the National Coal Board, for his co-operation in the investigation of Case 1 and for the results of the tests which he carried out in connexion therewith ; and to Mr. David Beavis, Controller of the Edinburgh Division of the Scottish Gas Board, for the report of the investigation carried out by his department in connexion with the other two fatalities.

# LOCAL HYDROCORTISONE FOR HUNNER'S ULCER OF THE BLADDER

## PRELIMINARY REPORT

BY

**J. H. JOHNSTON, F.R.C.S.**

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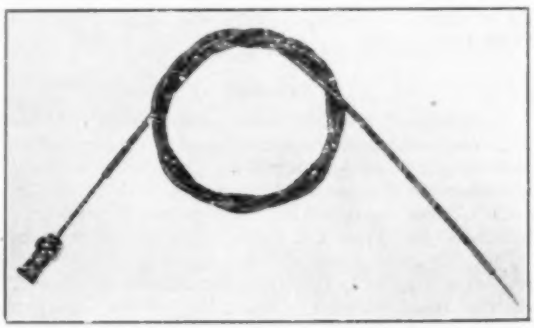
Local infiltration with hydrocortisone has been used effectively in the treatment of a variety of non-specific inflammatory and fibrotic processes. It appeared reasonable to expect that a similar resolution of focal inflammation with relief of symptoms would be produced by this means in cases of Hunner's ulcer of the bladder. Three patients with this condition have therefore been so treated.

### Technique

The injection is carried out cystoscopically through a specially devised "needle" (see photograph). A size 0 hypodermic needle is filed through 1.5 cm. from its point



and lengthened by the interposition, between the two portions, of a size 5E ureteric catheter from which the eyelet end has been removed. The catheter is found to grip the needle securely, and there is no risk of the point becoming detached.

At cystoscopy, using an irrigating instrument and with the patient in the lithotomy position, the affected region of the bladder is identified. The needle, with a stylet in position almost to the point, is passed through the catheterizing or operating channel of the cystoscope and inserted into the bladder wall at or near the ulcer. An assistant is required to withdraw the stylet and inject about 0.5 ml. of hydrocortisone suspension. In all, 5 ml. containing 25 mg. of hydrocortisone per ml. is injected through several punctures into and around the involved area. Penetration of the bladder wall obliquely is found to minimize the tendency of the suspension to flow back from the puncture wound during the injection and after withdrawal of the needle. Ballooning of the vesical mucosa may be produced, but it is probably preferable to inject more deeply into the bladder muscle.

### Results

The patients were women aged 63, 68, and 73 years, and were known cases of Hunner's ulcer of two, three, and six years' duration. Treatment by bladder distension under anaesthesia, zinc ionization, and vesical irrigation had formerly been carried out on many occasions. In January, 1956,

each one had one session of hydrocortisone therapy. All have shown marked symptomatic improvement which began a few days after the injection. In the case of the patient with the shortest history of the condition the result was dramatic. On admission to hospital she was passing urine every 30 to 45 minutes during the day and night. Other methods of treatment in the preceding two years had produced amelioration of symptoms for a few days only. For four months after the hydrocortisone injection she micturated every two to three hours during the day and once or twice at night. Recently there has been a gradual recurrence of the original complaint.

The total duration of the remission produced by hydrocortisone is not known, but it is to be expected that, when symptoms recur, further infiltration will again be effective, as is the case with other chronic inflammatory conditions. The results obtained with these patients would appear to justify a more extended trial of local hydrocortisone for Hunner's ulcer, especially in the early case before diffuse fibrosis has developed. Since this investigation began Schulte and Reynolds (1956) have reported satisfactory results of a similar technique using hydrocortisone and hyaluronidase.

I am grateful to Professor Charles Wells for his encouragement and for permission to carry out this procedure.

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# OBSERVATIONS ON THE FOOD HABITS OF MYOPIC CHILDREN

BY

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*Ophthalmologist, Miller and Barnet General Hospitals; Research Fellow in Ophthalmology, Guy's Hospital*

In the course of an inquiry into the development of myopia in children, which included questions about their diet, I was struck by the number of children who have rigid likes and dislikes of certain foods to the extent of consistently refusing some items.

The main sources of first-class protein are milk, cheese, meat, fish, and eggs. Over a period all the children attending a school clinic for refraction were asked whether they consistently refused one or more of these foods. The refusal to take milk as such or as a mainly milk drink was counted as an absolute refusal. It is interesting in this connexion to find a number of children who refuse their school milk—thereby providing others with a double or sometimes treble portion.

It was possible to divide the children into groups of myopes who were rapidly deteriorating, slowly deteriorating, or stationary. A fourth group consisted mainly of hypermetropes with a few emmetropes.

## Results

Tables I, II, and III show that myopes are more fussy about some of their food than other children. This was noted as a generalization by Miller (1940), though not in relation to these particular items. With increasing fussiness there is an increase in the activity of the myopia. The boys with highly active myopia show a refusal rate more than twice that of boys who are not myopic, and the girls a rate over 50% higher. Double refusals are twice as frequent amongst active myopes as amongst others.

TABLE I.—*Refusals of Protein Sources*

| | Active Myopia Rate > 1 D per Annum | | Active Myopia Rate 1 D per Annum | | Stationary Myopia | | Others | |
|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls |
| No. | 9 | 26 | 42 | 59 | 27 | 49 | 73 | 76 |
| No. of refusals | 5 | 17 | 20 | 30 | 12 | 22 | 18 | 32 |
| Refusals per head | 0·55 | 0·65 | 0·47 | 0·50 | 0·44 | 0·45 | 0·24 | 0·42 |

TABLE II.—*Percentage of Children Refusing Protein Sources*

| | Myopes (264) | Others (149) |
|---|---|---|
| Refusal of milk | 16% | 5% |
| ,, ,, cheese | 18% | 14% |
| ,, ,, meat | 3% | 4% |
| ,, ,, fish | 12% | 8% |
| ,, ,, eggs | 4% | 2% |

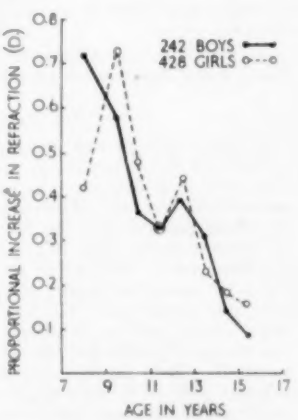
The percentage figures shown in the different categories are not mutually exclusive.

TABLE III.—*Percentage of Children Refusing Two or More Sources*

| | Active Myopes | Stationary Myopes | Others |
|---|---|---|---|
| No. | 136 | 128 | 149 |
| Percentage refusing two protein sources | 11 | 7 | 5 |

That girls are more particular than boys about their food is well known, and in all these groups this is confirmed, though it is small in stationary and slowly deteriorating myopes. Though the rate of refusal is higher in girls than in boys in each group, it does not equal the rate of refusal for boys in the next group with a higher rate of myopic change.

Between the ages of 8 and 17 the refraction of girls changes more often than that of boys (Brown, 1938). My own figures agree substantially with this observation. The Chart shows the mean proportional changes in refraction per annum of male and female myopes aged 8 to 16. Between the ages of 9 and 13, and again between 14 and 16, myopia in girls increased at a faster rate than in boys.




Proportional change in refraction of myopes per annum.

The percentage refusing a particular source of protein do not provide any conclusive information. The most striking difference is in milk consumption. Over three times as many myopes refused milk as others.

## Conclusion

It must not be concluded that myopia in children is associated dietetically exclusively with a different pattern of protein consumption, still less with a deficiency in the accepted sense of the word. There is evidence (to be published later) that other food factors are implicated, and in most individual cases the food pattern is in no way basically abnormal even though the myopia may be increasing rapidly.

Before coming to a conclusion on the exact significance of these findings, the unusual growth of myopes (Gardiner, 1954, 1955) must be linked with more detailed dietary intakes (to be published). None the less, the positive finding in this investigation is that myopic children are more particular about their sources of first-class protein than other children. There is an indication that this may be connected with their

myopia because girls are more prone to pick and choose than boys and because the more active the myopia the higher the rate of refusal per head.

**Summary**

The refusal rates of items of first-class protein are shown to be higher in myopic children than in other children.

It is debatable whether this is connected with their myopia.

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# Medical Memorandum

## Dissecting Aortic Aneurysm Presenting as a Cerebral Catastrophe

It is a well-known fact that a dissecting aneurysm of the aorta can present in many guises, and neurological symptoms and signs are by no means rare. More commonly, however, it is the spinal cord and the pelvic nerve plexuses which are affected, and thus a flaccid paralysis involving one or both lower limbs is a more familiar picture in these patients.

The following case emphasizes that aortic aneurysm can closely mimic apoplexy or subarachnoid haemorrhage.

### CASE REPORT

A collier aged 54 had enjoyed good health all his life until at 2 a.m. on September 30, 1954, while working on night shift in a coal-mine, he suddenly collapsed, became unconscious, and was admitted to hospital in deep coma. His blood pressure was 160/90 mm. Hg. The left pupil was larger than the right, all abdominal reflexes were absent, and there was a bilateral extensor plantar response. He had a left-sided hemiplegia, more marked in the face and arm than in the leg. The cerebrospinal fluid was clear, under normal pressure, contained 1 lymphocyte per c.mm., and 55 mg. of protein per 100 ml.; the globulin was slightly increased. Both the Wassermann reaction and the Lange colloidal gold curve were negative. Thirty-six hours after admission he regained consciousness, although weakness of his left arm and the left side of his face persisted for a further three days. By the evening of October 5 he felt much improved. At no time did he complain of any pain in his chest. At 10 p.m. he suddenly collapsed in bed and died almost instantaneously.

*Necropsy Findings.*—A dissecting aneurysm of the thoracic aorta was revealed. There were two large rents in the intima, measuring 17 and 10 mm. respectively, situated about 2 cm. above the aortic valve. From that point dissection had taken place upwards along the arch of the aorta as far as the origin of the left subclavian artery. The dissection had extended upwards into the innominate, the left common, and, to a less extent, the left subclavian artery. The innominate artery was partially, and the left common carotid artery almost completely, obstructed by prolapse of media and intima into the lumen of the vessel due to pressure of blood clot. Finally, dissection had also extended downwards and burst into the pericardial sac, which contained 600 ml. of partially clotted blood. There was widespread atheroma of the thoracic aorta with ulceration of the intima in two places. The heart showed a moderate degree of left ventricular hypertrophy, and there were numerous fatty plaques of atheroma in both coronary arteries. The abdominal aorta likewise contained atheromatous patches, but there was no ulceration. The lungs and abdominal viscera were congested. The brain and meninges showed no demonstrable disease. A Kahn test of the blood obtained after death was negative.

### COMMENT

Shennan (1934) produced a very comprehensive review of altogether 300 cases of aortic aneurysm, including 17 cases of his own. He quoted a total of nine cases with cerebral symptoms due to compression or thrombosis of one or both common carotid arteries. Since then several excellent papers have been published on the subject. Weisman and Adams (1944) described 11 cases of dissecting aneurysm with neurological complications. Most of these cases presented with a flaccid paralysis of one or both lower limbs due to occlusion of the common iliac arteries. Only one of their cases showed blockage of one of the carotid arteries; this patient had presented with mental confusion and dysphasia, but not hemiplegia. Baer and Goldburgh (1948) found hemiplegia due to occlusion of one of the common carotid arteries in 2 out of 44 cases of dissecting aneurysm. MacCuish (1953) described a patient who, like the present case, showed sudden coma and hemiplegia as the presenting features.

The comparative rarity of cerebral symptoms in these cases, though dissection commonly extends along the whole course of the aorta, is attributed by Weisman and Adams to the good collateral circulation produced by the circle of Willis. In the present case both the innominate and left carotid arteries were partially occluded; this may account for the severity of the cerebral signs. Partial recanalization of the innominate artery and establishment of a collateral circulation via the vertebral arteries may explain why our patient recovered consciousness and why his hemiplegia gradually wore off until eventually he died owing to rupture of the aneurysm into the pericardial sac.

Schnitker and Bayer (1944) seek the origin of dissecting aneurysm in a localized patch of medial degeneration and not in a primary defect of the intima, as is thought by many. The aetiology in the present case, however, was almost certainly atheromatous; the presence of plaques of atheroma in the aorta, the patient's age, and the negative serological tests all support this view.

A very unusual feature of the case under discussion was the complete absence of pain in the chest, which has been described as the first symptom in practically all the hitherto published cases. A correct ante-mortem diagnosis was thus rendered even more difficult in the present case.

My thanks are due to Dr. C. W. Healey, under whose care the patient was admitted.

C. GILES, M.D., B.Sc.,
Consultant Pathologist, City General Hospital, Stoke-on-Trent.

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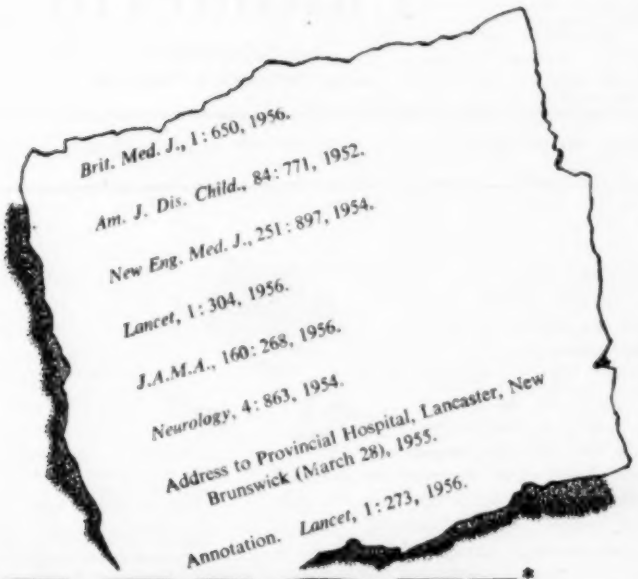
Two food taboos encountered by the East African Medical Survey during a survey of the dietary pattern in Kwimba District, Sukumaland, are described in the *Annual Report of the East African Council for Medical Research 1954–5*. Two series of observations were made during the survey, the first in August, September, and October, the second in March and April, on account of the seasonal rains. Dr. H. Trant led the team. The taboos concerned a "mud" fish and goats' milk. Dr. Trant notes: "The former is not eaten at all by women and the latter is used only for newborn babies as a first day's food. Very occasionally a small boy herding goats may take a drink of milk, but if this is known he is always held up to derision. One authority has suggested that this is really a 'snob' prohibition which came into common custom at the time when the people concerned started to own cattle."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# Reviews

## PATHOLOGY

*An Introduction to Pathology.* By G. Payling Wright, D.M., F.R.C.P. Second edition. (Pp. 636+xii; illustrated. 40s.) London, New York, Toronto: Longmans, Green and Co. 1954.

*Pathology.* By Peter A. Herbut. (Pp. 1,227; illustrated. £6.) London: Henry Kimpton. 1955.

The original purpose of Payling Wright's *Introduction to Pathology* was to revive an interest in the scientific study of the causation of disease, and the mechanisms which underlie disease processes, by employing the experimental disciplines of biology and physiology. Its first edition, published in 1950, has certainly engendered a keener perception of the scope and content of general pathology as an essential introduction to the study of human disease. A second impression appeared in 1951 and a third in 1952. The second edition, published in 1954, has been revised. It will be welcomed not only by the student as a reliable guide to the general principles of pathology, but also by his teachers, and it will be appreciated by all thoughtful clinicians. Many new references and illustrations have been included and two new chapters added. One of these deals with the origin and nature of allergy and the tissue changes which occur in hypersensitivity reactions. The other is concerned at a general explanatory level with the cell and tissue changes which are brought about by ionizing radiations. Reviewing this second edition provides the opportunity to comment on the author's ability to examine a mass of historical, clinical, and pathological evidence, discard the non-essentials, and frame a sound and valid generalization.

Professor Herbut's book is "an attempt to reduce an encyclopaedic amount of information to the confines of a single volume. To achieve this end a rather rigid pattern is necessarily followed throughout the text and the material is presented with little if any adornment." As there are 1,378 illustrations and 6 colour plates, and the price is £6 sterling, this absence of adornment clearly refers to the text, which is terse enough to be almost irritating.

"Pathology" for this author means the descriptive morbid anatomy and histology of human disease, and most of the text is concerned with this aspect of the subject. An exceptionally full but strictly factual account of the structural changes which accompany each disease is followed by a brief catalogue, with a profusion of commas, of its clinical signs and symptoms and of the diseases with which it may be confused. This method of parallel description, packed with detail on the anatomical side and far too brief on the clinical aspects, is claimed to provide "a bird's eye view of the disease as a whole" and is called clinico-pathological correlation.

Professor Herbut has certainly reduced "an encyclopaedic amount of information," but from the size of his book he appears almost to have succeeded in writing another encyclopaedia, which will be valuable as a work of reference for the busy hospital pathologist who is responsible for morbid anatomical and histological diagnosis. From this point of view the book has a place in pathological literature, and its publication will introduce some of us to an American morbid anatomist of wide experience and mature judgment. His approach is realistic and will instruct the student in the art of clinico-pathological diagnosis. In another sense it is dangerous, for it may leave him with the impression that the science of pathology is solely concerned with descriptive morbid anatomy. This criticism would have been met if the accounts of the morbid anatomy of specific diseases had been prefaced by a full explanatory introduction along the accepted lines of general pathology.

G. HADFIELD.

## FERTILIZATION

*Fertilization.* By Lord Rothschild, G.M., Sc.D., F.R.S. (Pp. 170+ix; illustrated. 18s.) London: Methuen and Co. Ltd. New York: John Wiley and Sons Inc. 1956.

When it is realized that no book on fertilization has appeared for more than twenty-five years the significance of this small monograph, with its bibliography of some 400 references—most, of course, comparatively recent—at once becomes apparent. The further fact that it is written by one of the outstanding contributors to our knowledge of the subject makes this book something of an event for all students of fertilization. Of course, it is apt to be rather heavy going for anyone not specifically interested in the subject. After all, a whole book devoted to "the life of the egg from the attachment of the fertilizing spermatozoon to the fusion or apposition of the male and female pronuclei," which process, "except in mammalian eggs, usually takes a little less than one hour," is bound to go into the minutiae to a considerable extent, and these must be of very limited interest, except to the student of the subject. The latter, however, will find himself more than well served, not merely because this is the best and most extensive review of the subject he can have met, but because, unlike most modern reviews, this book expresses the writer's definite and very authoritative opinions on controversial matters. It also contains the novel feature of a list of experiments which Lord Rothschild thinks would be well worth while doing. The book includes chapters on the morphology of fertilization; sperm–egg interacting substances; the metabolism of eggs; metabolic, structural, and other changes at fertilization; polyspermy, bioelectric measurements, and the specificity of fertilization. Lord Rothschild apologizes—though he scarcely need do so—for the omission of such matters as androgenesis and gynogenesis, merogony and parthenogenesis. He has included, in addition to an excellent general index, an index of the names of plants and animals quoted—a most important feature in view of the confusion which has sometimes resulted from the failure of authors of papers on this subject to name accurately the species on which they were working. G. I. M. SWYER.

## EAR, NOSE, AND THROAT DISEASES

*Diseases of the Ear, Nose, and Throat.* By William Wallace Morrison, M.D. Foreword by Arthur W. Proetz. Second edition. (Pp. 756+ix; illustrated. 84s.) Staples Press Ltd. 1956.

This somewhat lengthy book could be shortened with advantage by the omission of material which is now obsolete and historical, such as the description of Killian's operation on the frontal sinus, and also such unnecessary discussion of the definition and treatment (with figure) of synechia following operations on the nose. The arrangement of the subject-matter is rather haphazard; for example, new growths of the external meatus are sandwiched in between the various types of dermatitis affecting this region. The illustrations, 359 of them, are small and cramped and often difficult to interpret. Each section is prefaced by the appropriate anatomy and physiology, which, despite the criticism of some, would appear to be very desirable in view of the woeful ignorance of undergraduates on this particular subject. A useful list of references concludes each chapter. The section on sulphonamides and antibiotics is thoroughly up-to-date, and there is a further chapter devoted to headache and the neuralgias of the head and neck which will be read with interest and benefit. An account is given of the prophylaxis of the common cold, and, though this is interesting, the measures advocated are quite unpractical. There is no mention of anosmia under the symptoms of choanal atresia, and pharyngeal diverticulum is apparently described under oesophageal diverticula, which is rather confusing. These are just two instances of matters which give grounds for criticism, but there are many more. There is a useful appendix of symptoms and of formulary. Of course there is much that is of value in a book of this size, and it will prove a useful addition as a work of reference. J. P. STEWART.

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## HYPOMETABOLISM

The basal metabolic rate (B.M.R.) is a measure of the metabolic response of the body tissues to thyroid hormone. A reduction in the B.M.R. below the lower limit of normal occurs in a number of conditions such as thyroid disorders, starvation and malnutrition from any cause, nephrosis and other conditions associated with generalized oedema, and some cases of schizophrenia. The lowered metabolism in oedematous states may be due to inclusion of the fluid retained in the oedematous tissues in the bodyweight, from which the B.M.R. is calculated, and to diminished heat loss from the insulation provided by the fluid. In malnutrition the activity of the thyroid gland is reduced as a consequence of diminished secretion of thyrotrophic hormone from the pituitary. The cause of the hypometabolism in some cases of schizophrenia is less certain, but the fact that such patients can tolerate large doses of thyroid extract without any increase in B.M.R. or the development of the symptoms and signs of hyperthyroidism that would occur in a normal person suggests that the responsiveness of the tissues is inexplicably diminished. Hypometabolism due to diminished secretion of thyroid hormone is on rare occasions caused by an enzymic defect partially preventing the normal biosynthesis of hormone in the thyroid gland,[1-4] and the associated enlargement of the gland is a compensatory attempt to correct this deficiency. Although uncommon, and sometimes familial, these cases are of scientific importance because they give clues to the chemical steps in the synthesis of thyroid hormone. More often hypometabolism due to diminished secretion of the thyroid hormone is secondary to a reduction in the amount of physiologically active thyroid tissue. This occurs in congenital athyrosis (cretinism), in juvenile myxoedema (the predominant manifestation at this age is failure of skeletal growth), idiopathic atrophy in adults (myxoedema), after removal of too much thyroid tissue or as a sequel to too much radio-iodine in the treatment of hyperthyroidism, as a temporary phenomenon in acute thyroiditis, in Hashimoto's struma lymphatosa (in which the thyroid gland is hard and often there are associated positive serum-flocculation reactions),[5] and as a consequence of a reduction in the secretion of thyrotrophic hormone resulting from pituitary insufficiency from any cause. In all these conditions the symptoms and signs of hypothyroidism can be relieved with thyroid extract; experimental data indicate that the daily normal output of the adult thyroid gland is equivalent to about 3 gr. (0.2 g.) of thyroid extract.

The exact nature of the thyroid hormone is still uncertain. Formerly the only active iodinated substance in the plasma was thought to be L-thyroxine, and this was accepted as the thyroid hormone.[6 7 8] Synthetic L-thyroxine has a metabolic activity such that 0.1 mg. is equivalent to about 1 gr. (65 mg.) of thyroid extract. Being a pure substance of known composition, it is preferred by some authorities to thyroid extract for the treatment of hypothyroidism. Recent chromatographic studies have detected other highly potent iodinated substances in thyroglobulin[9] and in plasma.[10 11] The most important of these is L-triiodothyronine, which is perhaps the tissue-active form of thyroid hormone and is slowly liberated from the stable reservoir of thyroxine. Quantitatively L-triiodothyronine is at least five times as potent as L-thyroxine in the treatment of myxoedema[12 13]; it is much more rapid and transient in its effect, producing a rise in the B.M.R. within a few hours, whereas thyroxine takes at least five days to exert an effect. Apart from myxoedematous coma, where speed of action is essential, triiodothyronine has no apparent advantage over thyroxine in the treatment of hypothyroidism, and indeed the rapidity of its action makes it potentially more dangerous in patients with associated heart disease.

The diagnosis of adult myxoedema is usually easy if the possibility of the condition is remembered. Recognition of less severe degrees of hypothyroidism is more difficult. Symptoms usually comprise listlessness, lack of physical and mental energy, and vague arthritic and muscle pains. Physical findings include

[1] Stanbury, J. B., and Hedge, A. N., *J. clin. Endocr.*, 1950, **10**, 1471.
[2] Hutchinson, J. H., and McGirr, E. M., ibid., 1954, **14**, 869.
[3] Hubble, D., *Lancet*, 1953, **1**, 1112.
[4] Stanbury, J. B., Kassenaar, A. A. H., Meijer, J. W. A., and Terpstra, J., *J. clin. Endocr.*, 1955, **15**, 1216.
[5] Luxton, R. W., and Cooke, R. T., *Lancet*, 1956, **2**, 105.
[6] Harington, C. R., and Barger, G., *Biochem. J.*, 1927, **21**, 169.
[7] Taurog, A., and Chaikoff, I. L., *J. biol. Chem.*, 1948, **176**, 639.
[8] Laidlaw, J. C., *Nature* (*Lond.*), 1949, **164**, 927.
[9] Roche, J., Michel, R., Lissitzky, S., and Michel, O., *C. R. Acad. Sci.* (*Paris*), 1951, **234**, 997.
[10] Gross, J., and Pitt-Rivers, R., *Lancet*, 1952, **1**, 439.
[11] Michel, R., *Ann. Rev. Physiol.*, 1956, **18**, 457.
[12] Gross, J., Pitt-Rivers, R., and Trotter, W. R., *Lancet*, 1952, **1**, 1044.
[13] Blackburn, C. M., and Keating, F. R., *J. clin. Invest.*, 1954, **33**, 918.
[14] Freedberg, A. S., Kurland, G. S., and Hamolsky, M. W., *New Engl. J. Med.*, 1955, **253**, 57.
[15] Kurland, G. S., Hamolsky, M. W., and Freedberg, A. S., *J. clin. Endocr.*, 1955, **15**, 1354.
[16] Pearson, H. E. S., *British Medical Journal*, 1956, **2**, 657.

in most cases a reduction in the size of the thyroid gland, dryness of the skin, and lack of sweating. Confirmation of the diagnosis is obtained most satisfactorily by measurement of the B.M.R., which is below the lower limit of normal, and by the electrocardiogram, which shows flat T-waves—both abnormalities being corrected by administration of thyroid extract, thyroxine, or triiodothyronine. In the past there has been a tendency to diagnose minor degrees of hypothyroidism without sufficient evidence; this has been particularly noticeable in the U.S.A., where many physicians have their own B.M.R. machine and patients commonly inquire about the level of their "basal."

Recently another possible variety of hypometabolism has been described by Freedberg and his co-workers as "nonmyxoedematous hypometabolism."[14 15] Four male patients whose symptoms comprised lack of energy, fatigue, somnolence, nervousness, irritability, aching of the muscles and joints, sensitivity to cold, and diminished potency were found to have periorbital puffiness without other signs of myxoedema and a B.M.R. of −25%. Other measurements of thyroid function—serum protein-bound iodine, radio-iodine uptake, and serum cholesterol—were normal. These patients failed to respond to thyroid extract or L-thyroxine alone, but did so to large doses of L-triiodothyronine or to smaller doses in combination with thyroxine. The suggested explanations for these therapeutic results include a defect in the gastro-intestinal absorption of thyroid extract and thyroxine, failure at the tissue level to convert thyroxine to triiodothyronine, impaired permeability of the cells to thyroxine but not to triiodothyronine, and a deficiency in triiodothyronine, which may be necessary for the optimal utilization of thyroxine. Other explanations might lie in the potency of the thyroid extract used and in the dosage and duration of treatment with thyroxine. Pending the outcome of further investigations and confirmation of the present findings by other workers, it would be wise to keep an open mind on this type of hypometabolism. To administer, without further investigation, triiodothyronine to any patient who complains of some or all the symptoms outlined above is not in keeping with the best in modern medical practice and will only delay elucidation of the nature of this hypometabolic state. Many such patients will be suffering from psychoneurosis: at best triiodothyronine will then do no good; at worst it may serve to increase their difficulties by inducing palpitations or, as pointed out by Dr. H. E. S. Pearson[16] in our correspondence columns last week, more serious cardiac trouble.

## BROWN INDURATION OF LUNG

Pulmonary haemosiderosis, or brown induration of the lung, is well known to occur in cases of mitral stenosis accompanied by hypertrophy of the right ventricle. In this condition A. C. Lendrum and colleagues[1] described a focal distribution throughout the lungs of nodules consisting of four to twenty adjacent alveoli filled with siderocytes (macrophages engorged with haemosiderin). In addition, ferrous impregnation of the elastic tissue of the alveolar walls and small arteries results in fracture of the affected elastica, with giant-cell reaction, even to the extent of the development of giant-cell granulomata.[2] An identical picture may also be seen in patients with systemic hypertension who survive several attacks of left ventricular failure. Lendrum and colleagues[1] suggest that this type of pulmonary haemosiderosis is due to long-standing right ventricular preponderance, with resultant varicosity and repeated haemorrhages in the anastomoses between the bronchial and pulmonary circulations in the region of the respiratory bronchioles. Recently A. H. Cameron[3] has described two cases of pulmonary haemosiderosis associated with bronchiectasis. Cor pulmonale and hyperplastic changes in the small vessels of the lung indicated that there had been pulmonary hypertension in both patients, and it is suggested that pulmonary hypertension and inflammatory vascular engorgement are the factors responsible for the haemorrhage from bronchiolar mucosa.

It is, perhaps, less widely known that a very similar pathological state may arise in young people who do not suffer from any preceding disease of the heart or lungs. To this has been given the name idiopathic pulmonary haemosiderosis (or essential brown induration of the lung). This condition bears no relationship to haemochromatosis, in which there is an abnormality of iron metabolism not present in pulmonary haemosiderosis. In 1948 W. G. Wyllie and others[4] reviewed the pathological and clinical features of idiopathic pulmonary haemosiderosis as seen in 7 cases at the Hospital for Sick Children, Great Ormond Street, and in 17 cases culled from the literature. The histological appearances are the same as those seen in pulmonary haemosiderosis secondary

[1] Lendrum, A. C., Scott, L. D. W., and Park, S. D. S., *Quart. J. Med.*, 1950, **19**, 249.
[2] —— *J. Path. Bact.*, 1950, **62**, 555.
[3] Cameron, A. H., *Thorax*, 1956, **11**, 105.
[4] Wyllie, W. G., Sheldon, W., Bodian, M., and Barlow, A., *Quart. J. Med.*, 1948, **17**, 25.
[5] Browning, J. R., and Houghton, J. D., *Amer. J. Med.*, 1956, **20**, 374.
[6] Wynn-Williams, N., and Young, R. D., *Thorax*, 1956, **11**, 101.
[7] King, A. B., *Proc. roy. Soc. Med.*, 1949, **42**, 87.
[8] Gellis, S. S., Reinhold, J. L. D., and Green, S., *A.M.A. Amer. J. Dis. Child.*, 1953, **85**, 303.

to heart disease, with this exception. Whereas in the latter the damage is focal because of haemorrhages in individual respiratory bronchioles, each related to a group of alveoli, in idiopathic pulmonary haemosiderosis the haemorrhage is intra-alveolar and diffusely spread throughout the lungs. The pathogenesis is unknown, but most workers have stressed the possibility of a primary defect of the elastic tissues of the walls of the small blood vessels and alveoli. The changes are slight to begin with and the clinical features appear insidiously. As larger parts of the lungs become affected, anoxaemia results in dyspnoea and cyanosis.

The condition, though sometimes seen in adult life,[5,6] occurs mainly in children.[4] There is no obvious hereditary tendency. The clinical course is episodic, and remissions of variable duration and completeness occur. The presenting signs are tachycardia and cyanosis associated with dyspnoea, pallor, fever, and, in some cases, jaundice. Cough and vomiting or abdominal pain are often troublesome. There may be signs of congestive cardiac failure such as cardiac enlargement, over-filling of the veins of the neck, gallop rhythm, and enlargement of the liver and spleen. Frank haemoptysis, an uncommon symptom in young children, has been a feature in most of the cases recorded. The test for occult blood in the faeces is often positive. A few rales and rhonchi may be heard over the lungs, but the paucity of physical signs contrasts sharply with the grossly abnormal *x*-ray appearances. These consist of a generalized mottling most pronounced towards the roots of the lungs. As the acute episode subsides a reticular pattern develops, which may clear completely between the earlier attacks. Lobar collapse may also occur. The blood shows a hypochromic anaemia, often severe, which may respond to iron. In addition, there are "pseudo-haemolytic" features such as a reticulocytosis, the presence of nucleated red cells in the blood films, slight jaundice, indirect positive van den Bergh reaction, excess urinary urobilinogen, and the presence of cold auto-agglutinins. Absence of methaemalbumin excludes intravascular haemolysis. The anaemia has been interpreted[4] as the result of recurrent pulmonary haemorrhages, and the peculiar pseudo-haemolytic features are explained by the fact that the blood is not shed outside the body but within it—that is, into the lungs. The presence of cold auto-agglutinins may be an antibody response to the destruction of red blood cells within the lungs. Acute episodes may subside quickly or last for several months, but in the intervals the patient is debilitated, underweight, and easily made breathless. Ultimately clubbing of the fingers develops. The prognosis is bad, and death results in due course from asphyxia and loss of blood.

The diagnosis is usually based on the characteristic radiographic appearances. The striking anaemia and the absence of distinctive physical signs over the lungs may lead to an erroneous diagnosis of iron-deficiency or haemolytic anaemia, but the presence of dyspnoea and cyanosis often associated with haemoptysis should indicate the need for a chest radiograph. The diagnosis may be confirmed by finding macrophages containing haemosiderin in the sputum, in stomach contents obtained by aspiration, or in material obtained by lung puncture.[7,8] The diagnosis can be accepted only in the absence of an organic defect of the heart such as mitral stenosis. The *x*-ray appearances are closely similar to those seen in chronic miliary tuberculosis, xanthomatosis, Gaucher's lipoidosis, and sarcoidosis, which are excluded by appropriate investigations. It seems probable that some cases of miliary tuberculosis reported before the days of antibiotics to have improved spontaneously were really examples of idiopathic haemosiderosis.

Treatment has usually been confined to the administration of oxygen for anoxia and blood transfusion for anaemia. J. R. Browning and J. D. Houghton[5] have reported benefit in one case from giving A.C.T.H. and cortisone.

## LEUKAEMIA AND EXPOSURE TO X RAYS

The potential leukaemogenic nature of ionizing radiations is once again emphasized in a recent report by Dr. Alice Stewart and her colleagues,[1] whose findings suggest that exposure of children to *x* rays during their prenatal life may be an aetiological factor in the development of leukaemia in infancy and childhood. These workers studied the past histories of 547 children who had died from leukaemia or malignant disease in England before the age of 10 and during the years 1953 to 1955, comparing these with the histories of the same number of control children. They found an apparently significant excess of deaths from leukaemia, and also from other malignant diseases, among the children of mothers who had been subjected to *x*-ray examination of the abdomen during the relevant pregnancy. No similar excess of deaths was found among children who in the post-natal period had been subjected to diagnostic *x*-ray examination or to whom either sulphonamides or antibiotics had been administered. So far the histories of only about one-third of the children certified as dying from leukaemia or malignant disease during

the period in question have been reported upon, and when the final data are available the excess of deaths among children irradiated in prenatal life may well be different from that found at present. The preliminary findings, however, certainly appear to justify the authors' contention that prenatal irradiation may predispose children to the development of leukaemia or malignant disease during infancy and early childhood.

The report of Dr. Stewart and her colleagues follows closely upon that made by M. Faber[2] to the Fifth International Congress on Radiobiology, held in Stockholm last month, on the preliminary results of a study of the frequency of either diagnostic or therapeutic exposure to *x* rays in the histories of adult sufferers from various types of leukaemia. This work was based on the histories of cases of leukaemia recorded in the Danish Cancer Registry. In the belief that the incidence of chronic lymphatic leukaemia is not increased by exposure to *x* rays, Faber noted the differences in the frequency of a history of exposure to therapeutic or diagnostic *x* rays among patients with this form of leukaemia and those suffering from acute leukaemia or from chronic myeloid leukaemia. He found that a history of exposure to *x* rays was given with significantly greater frequency by patients with acute leukaemia or with chronic myeloid leukaemia than by those with chronic lymphatic leukaemia.

These studies of Faber and of Stewart and her colleagues suggest for the first time that the comparatively low doses of *x* rays received during diagnostic procedures may induce leukaemia. Prior to these publications evidence had accrued from other human studies that much larger doses of radiation than are used in *x*-ray diagnosis are leukaemogenic. The well-known facts from Hiroshima and Nagasaki have been supplemented by the results of a survey of the incidence of leukaemia among patients treated with *x* rays for ankylosing spondylitis, as reported by W. M. Court Brown and J. D. Abbatt,[3] and recently more extensively by W. M. Court Brown and R. Doll in the report[4] of the Medical Research Council's Committee on the Hazards to Man of Nuclear and Allied Radiations. Further, C. L. Simpson and her colleagues[5] have reported an increased incidence of both leukaemia and cancer of the thyroid in children given mediastinal irradiation for thymic enlargement.

It can now be accepted without reserve that ionizing radiations can cause leukaemia in man. The nature of the relationship between the incidence of leukaemia and the dose of radiation and, consequently, an understanding of the scale of risks involved remain to be discovered. It will be of the greatest importance to determine by direct observation, or to predict with some degree of confidence, whether a threshold dose of radiation exists below which exposure is not associated with an increased risk of inducing leukaemia. Court Brown and Doll[4] thought that the possibility of very small doses of radiation having a leukaemogenic effect could not be ruled out; their further studies, as recently reported by Court Brown[6] to the Sixth International Congress of Haematology at Boston, give added weight to the suggestion that over low ranges of dose there may be a simple proportional relationship between the incidence of leukaemia and the radiation dose. In such circumstances no threshold dose of radiation would exist. It may well be, however, that the foetus is more sensitive to the leukaemogenic effects of radiation than either the child or the adult.

The preliminary results reported by Faber and by Stewart and her colleagues are in keeping with the concept that low doses of radiation, such as are received during diagnostic procedures, may increase the probability of the development of leukaemia, but further studies will have to be undertaken to test this hypothesis and to establish it in a convincing manner or to repudiate it on sure grounds. In the meantime two precautionary steps can be taken. The first is to develop techniques of *x*-ray examination which will reduce as far as possible the amount of radiation received during any single exposure, and for this purpose more attention might well be paid to the use of image intensifiers. The second step was clearly stated by the Medical Research Council's committee,[4] which concluded, so far as peacetime hazards were concerned, "that, as all such radiations are potentially dangerous, their use should be the subject of constant and close scrutiny, and that adequate justification should be required for their employment on however small a scale." The findings of Stewart and her colleagues reinforce this plea for "adequate justification" especially for an *x*-ray examination of the abdomen during pregnancy.

[1] Stewart, A., Webb, J., Gile, D., and Hewitt, D., *Lancet*, 1956, **2**, 447.
[2] Faber, M., Fifth International Congress on Radiobiology, Stockholm, August, 1956.
[3] Court Brown, W. M., and Abbatt, J. D., *Lancet*, 1955, **1**, 1283.
[4] *The Hazards to Man of Nuclear and Allied Radiations*, 1956, H.M.S.O., London.
[5] Simpson, C. L., Hempelmann, L. H., and Fuller, L. M., *Radiology*, 1955, **64**, 840.
[6] Court Brown, W. M., Sixth International Congress on Haematology, Boston, August, 1956.

## PAINLESS CARDIAC INFARCTION

The occurrence of cardiac infarction without pain continues to excite interest, and recently the circumstances in which it might occur were reviewed in these columns.[1] Patients may not complain of pain, because it is overshadowed by some other symptom, especially severe dyspnoea,[2] syncope due to heart block,[3] or vomiting and acute circulatory failure. Rarely, arterial embolism

may indicate that cardiac infarction has occurred a few days earlier.[4] Not infrequently, cardiac infarction presents as angina of effort[5]; H. L. Blumgart and his colleagues[6] found evidence of old complete occlusion of at least one major coronary artery at necropsy in all cases of angina pectoris without valvular lesions or hypertension. However, undoubtedly some cases of cardiac infarction are symptomless. A low threshold to pain, altered perception of pain, slow infarction, and ischaemic destruction of nerve endings leading to analgesia have all been suggested as explanations.[7-9] The pain of myocardial infarction is certainly due to cardiac ischaemia, and the speed of the infarction and the presence and number of available collateral vessels will influence the amount of pain which accompanies the occlusion. Thus the occurrence of a major coronary artery occlusion in the absence of collateral vessels is likely to be followed by intense ischaemia and severe pain,[9 10] but when small areas of infarction occur in subjects with a collateral circulation the incidents may be "silent" until heart failure, arrhythmia, or sudden death occur, pain being absent or trivial.

In a recent paper W. Evans and G. C. Sutton[11] have drawn attention to this important problem in an investigation of 70 cases of painless infarction in 56 men and 14 women. They were careful to exclude the occurrence of pain by direct questioning of each patient soon after the onset of the illness, and to accept such symptoms as aching, sensations of pressure, "indigestion," and substernal discomfort as being equivalent to pain, and therefore necessitating exclusion from the series. Cardiographic evidence of infarction was insisted upon. In 26 of the 70 patients the absence of pain was associated with "restricted infarction," which the authors define as infarction which is limited in its distribution, and which gives rise to less obvious cardiographic changes which may escape detection unless carefully sought. Evans and Sutton believe that the absence of pain in this group was due not to the small size of the infarct but to the slowness of infarction, which in turn depends on the rate of arterial narrowing and the efficiency of the collateral circulation. In 21 of the 70 cases there was an auricular arrhythmia, usually fibrillation. Hypertension (associated with sinus rhythm in 9 and auricular fibrillation in 7) was present in 16 of the 70 cases. In 4 patients Stokes–Adams disease may have played a part in suppressing pain, while severe vomiting in two cases and cerebral embolism in one case could be considered as the equivalents of pain. The reason for the absence of pain in the group with auricular arrhythmias and hypertension is not entirely clear. Dyspnoea did not overshadow the pain, nor did heart failure play any part. Evans and Sutton considered the absence of pain in the hypertensive patients to be due to the increase in myocardial muscle mass, which may determine a slower rate of myocardial necrosis following coronary occlusion. The part played by the arrhythmias in suppressing the pain is uncertain, and it would be of interest to know the incidence of auricular fibrillation in a comparable series of their patients with painful cardiac infarction. Certainly the onset of auricular fibrillation in older subjects may be the result of ischaemic heart disease, though cardiographic evidence of infarction is not always present.

Evans and Sutton have underlined the importance of not demanding a history of typical cardiac pain for the diagnosis of cardiac infarction, and of considering the possibility in patients who present with such signs and symptoms as acute dyspnoea, syncope, vomiting, and arterial embolism. The possibility of infarction should especially be borne in mind in older subjects with unexplained auricular fibrillation with or without hypertension.

[1] *British Medical Journal*, 1955, **2**, 1374.
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## ATTACK ON INSECTS

A few months ago we drew attention to the fact that in many parts of the world strains of insect pests are emerging which are resistant to insecticides.[1] There is some connexion between the intensity at which insecticides are applied and the speed at which resistance develops. In Britain, for example, where the climate does not foster insect pests so freely as in warmer climates, there are fewer cases of resistance, and the almost ubiquitous immunity of houseflies to D.D.T. and other chlorinated hydrocarbon insecticides has developed more slowly. While the problem of resistance is not restricted to pests of medical importance, there are more definite cases of this type than among the far more numerous agricultural insect pests. Apart from the housefly, which is almost everywhere resistant to D.D.T. and its analogues, body lice and bed bugs are resistant in a number of places, though rarely in Europe; four different strains of anophelines which are malaria vectors are resistant (in Greece, Java, Saudi Arabia, and the U.S.A.) and several strains of culicine mosquito. The housefly is in most places resistant to gamma B.H.C., chlordane, dieldrin, and like substances; the German cockroach is resistant to this group in parts of the U.S.A.; one anopheline malaria vector (in N. Nigeria) is resistant and so are several culicines. The housefly has been reported resistant to organo-phosphorus insecticides in Denmark, where these compounds have been widely used.[2]

Altogether, there have been reports of resistance of over 20 species of insects of importance in public health, though in a few cases the evidence is not completely substantiated. This is certainly disturbing, though the trouble is still localized for most of the insects concerned, and many of them show only one type of resistance so far. It is important to watch for the emergence of resistance and to counteract it if possible. The only feasible alternative reactions at present are to attempt

[1] *British Medical Journal*, May 19, 1956, p. 1155.
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control by other than chemical methods or to change to different insecticides. The need for change has called attention to the prolific family of organo-phosphorus insecticides, to which only low levels of resistance have been recorded so far.[2] Several of them, now in use abroad, are no more dangerous to man than the chlorinated compounds; they include malathion, diazinon, chlorthion, "dipterex" and D.D.V.P. (apparently only the first is on the market in Britain). It must be admitted, however, that none of the known organo-phosphorus compounds has the long residual action of D.D.T. or dieldrin.

A possible line of defence against resistance which does not seem to have been adequately investigated is the combined use of insecticides of totally different types. Resistance is theoretically due to the survival (and breeding) of a few individual insects with abnormally high resistance to a particular type of poison. Addition of a different kind of poison might well prevent their survival.

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## RELAXIN

In many species, and especially in rodents, relaxation of the symphysis pubis occurs in late pregnancy. That this is under hormonal control was first shown in 1926 by F. L. Hisaw.[1] He called the substance responsible relaxin and detected it in the serum of pregnant rabbits. Subsequently, it has been shown to exist in several other pregnant mammals,[2-4] and can be obtained from extracts of rabbit placenta and sow's corpora lutea.[1 2 5] The substance is non-steroidal, and is thought to be a polypeptide, though no pure preparations have yet been made. Earlier doubts of the existence of such a substance, the effects of which, in guinea-pigs at least, could be reproduced by oestrogen and progesterone alone[6-9] can no longer be entertained, since A. A. Abramowitz *et al.*[10] have shown that 500 times the amount of relaxin necessary to produce a positive response in the guinea-pig was without either oestrogenic or progestational effect. Moreover, Hisaw *et al.*[11] further succeeded in differentiating the actions of relaxin and progesterone and showed that the latter acts only by stimulating the secretion of relaxin itself. Though relaxation can be produced by oestrogen alone, the dose required to prime animals for the action of relaxin is small and without effect by itself. It remains possible, however, that relaxin acts as a potentiator of oestrogen, since it is ineffective in the absence of prior oestrogen treatment; but, if so, its action in so potentiating oestrogen must be very powerful.[12]

More recently interest has turned to the uterine relaxation which may follow administration of aqueous extracts of corpora lutea. This was first convincingly demonstrated on the guinea-pig uterus *in situ* by J. C. Krantz, H. H. Bryant, and C. J. Carr[13] in 1950 and confirmed in 1953 by L. C. Felton, E. H. Frieden, and H. H. Bryant.[14] These latter authors studied the chemical properties of the "uterine relaxing factor" (U.R.F.), found it to be a protein or polypeptide, and concluded that there was a close relationship between it and relaxin. Whether U.R.F. and relaxin are identical remains uncertain.

Clinical interest in these substances arises from two uses to which the uterine-relaxing property of extracts of sow's corpora lutea have been put—the treatment of dysmenorrhoea and of premature labour. G. S. Jones and F. Smith[15] produced a report in 1954 on its use in the treatment of dysmenorrhoea: they showed that the active principle is not destroyed in the stomach and appears in the blood serum within 30 minutes after oral administration in human beings. In a series of 90 women who complained of dysmenorrhoea, symptoms were controlled by the treatment in 61, the results being regarded as sufficiently promising to warrant further trial. G. H. Rezek[16] has also reported good results in a series of 298 patients, complete relief of symptoms being obtained in some 70% of cases within fifteen minutes following an initial oral dose of 3,000 "units." There were no undesirable effects.

Of no less interest are two reports on the use of U.R.F. in premature labour. J. T. Majewski and T. Jennings[17] obtained good results in all but 4 of 21 patients in premature labour by giving 4,000 units initially, followed in one hour by 3,000 units, and thereafter 1,000 units hourly (all orally) until contractions ceased. E. Abramson and D. E. Reid[18] treated by intramuscular injections five patients who went into premature labour between the 29th and 31st weeks. In each case the pregnancy continued until the 36th to 40th weeks, with the delivery of a normal infant. Finally, E. Eichner *et al.*[19] made careful studies on the effects of intravenous and intramuscular injections of U.R.F. in labour and were able to modify and slow labour in all patients to whom adequate dosage could be given for over two hours before delivery. They further drew attention to the cervical softening which was induced by treatment in 30 of 39 patients and found that certain types of dystocia associated with disorganized contractions responded with normal labour and rapid delivery. It may not be too much to claim that the rather neglected "third ovarian hormone," as relaxin has been called, appears to have an interesting future in obstetrics and gynaecology.

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# THE CLINICAL PSYCHOLOGIST IN THE MENTAL HOSPITAL

BY

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The appearance of trained clinical psychologists in mental hospital practice is a comparatively recent phenomenon. It is therefore not surprising not only that many mental hospitals are still without psychologists but that those that do employ them are not all using them in the same way. Indeed, many medical men have but a sketchy notion of the training and capabilities of the clinical psychologist and are therefore not clear about what duties may properly be assigned to him. It is hoped that this article may make matters clearer by giving an account of how clinical psychologists are employed at the Crichton Royal, Dumfries, where the first psychologist was appointed twelve years ago.

## Training of the Psychologist

Arrangements for the selection and training of clinical psychologists are set out in the Ministry of Health circular P.T.A. 39 and the appropriate covering memoranda.

No psychologist is now accepted for clinical training unless he has an honours degree in psychology. He is then required to gain a further three years' experience with mental patients, usually in a mental hospital, under the supervision of a senior psychologist, before he can be regarded as being fully trained. At the end of this time, if he is to be allowed to continue, he must gain a proficiency certificate from his employing authority. This period of hospital experience may be reduced if he has also received postgraduate training in clinical psychology in a university department. The psychologist, then, comes into the mental hospital with a background of academic knowledge of normal psychology, in contrast to the psychiatrist, who begins with a training in general medicine. Thus, whereas the psychiatrist is interested in eliciting symptoms which may lead him to diagnosis and so to treatment, the psychologist is concerned more with describing the patient in terms of personality traits of intelligence, temperament, and character. The psychiatrist's training has given him a knowledge of the abnormal, the deviant, and the pathological; whereas the psychologist's training has given him a knowledge of the normal range of human behaviour.

## Work of the Psychologist

The work of the psychologist in the mental hospital may be classified under four heads: diagnosis, research, treatment, and teaching. It is unlikely that he will be able to give an equal amount of attention to each of these. All psychologists engage in a large amount of diagnostic interviewing and testing, which probably forms the major part of their work. The relative amount of time spent on research, treatment, and teaching depends on the psychologist himself and on the hospital in which he works. The man who is interested in research often does little or no treatment, and vice versa. As Sir Thomas Lewis (1930) pointed out, the research and clinical attitudes are not easily adopted by the same person concurrently. Whether or not the psychologist is called upon to teach depends on the presence in the hospital of medical officers training for their D.P.M. or of a school of nursing. Where psychology lectures are to be given the clinical psychologist is best fitted to give them.

*Diagnosis.*—The psychologist in his diagnostic work aims at providing information about a patient which will help the psychiatrist to assess the nature of the illness. The tests he uses are based on scientific research and depend as little as possible on personal subjective impressions and as much as possible on objective measurement. The intellectual level of the patient, as well as signs of intellectual impairment or deterioration, is always an important factor, and the psychologist is equipped to make objective assessments of all these. Disorders of perception or thinking may give the first indications of a cerebral lesion or functional psychosis. These can be fairly easily demonstrated by test procedures. The various so-called "projective techniques," such as the Rorschach ink-blot test and Murray's thematic apperception test, give valuable information about a patient's personality. The former gives indications of how the patient operates: anxiously, depressively, obsessionally, and so on; the latter yields information about his attitude and opinions with regard to his parents, death, violence, sex, and the like. Tests such as these not only help in diagnosis but are valuable research tools and often form a useful basis for psychotherapy.

*Research.*—So far as a psychologist has had training in scientific methods he is able to render valuable assistance in designing and in carrying out research projects; he can also give advice on scientific research in general. Since university courses in psychology usually include statistics, the psychologist is able to advise on statistical methods in medical research in the hospital. Recent psychological research at the Crichton Royal has included work on the effects of E.C.T. on memory and efficiency, the psychological changes in senile dementia, and the changes in attitude of alcoholics after treatment.

*Treatment.*—Not having a medical training, the psychologist does not, of course, undertake any of the physical treatments. He can, however, undertake the psychotherapy of suitable cases under the general supervision of the psychiatrist, who remains in charge of the case. As this form of treatment is very time-consuming, this part of the psychologist's work can be of great assistance to the psychiatrist. Since the former is never concerned with problems of administration, he tends to be regarded by the patient in a somewhat different light from either the psychiatrist or the nurse. Consequently it sometimes happens that the patient finds it easier to confide in the psychologist in the first instance. Some aspects of the patient's rehabilitation, too, are often more easily handled by the psychologist.

*Teaching.*—In lectures to medical officers training for their D.P.M. the psychologist should be able to supply the academic framework for the psychological knowledge necessary for the diploma, and in lectures to student nurses he should be able to relate psychological theory to practical issues on the ward. It is particularly necessary to encourage nurses to observe and understand themselves as a basis for understanding their patients.

## Role of the Psychologist in the Hospital

There has been a tendency at some hospitals to use psychologists as "scientific medical auxiliaries," much in the same way as radiographers, E.E.G. recordists, or biochemists. In this case the psychologist is based on his own separate department, which he leaves only when it is necessary to visit the ward to test the patient. In some cases the patient may even be brought to the psychologist in his department. This arrangement has obvious limitations. The presence of the psychologist in the ward to see a patient on request may be interpreted by the latter as indicating a serious turn of events in his treatment. As the psychologist is a stranger to the patient, rapport has to be established before he can usefully begin to test the patient, and this often involves the need for prolonged reassurance and encouragement. On the other hand, if the psychologist is based on the ward and is there every day and all day, he soon becomes recognized as part of the ward team of doctors and nurses. Patients indeed come to accept the psychologist as one of the group

of people he sees regularly, concerned as a team in his day-to-day treatment. The psychologist is not then a strange expert called in for a special purpose but is a well-known figure with whom most of the patients have a talk some time or other. When the psychologist works in this way the value of the material he gains from the patient is greatly enhanced. The patient knows him and has come to trust him, and it is recognized in the ward that patients go and see him. Therefore there is no strain; there is no initial discussion to be undertaken with a patient before valuable material can be elicited.

Another way in which the part the psychologist plays on the ward can be useful has already been mentioned: whereas the doctor and nurse are inevitably in positions of authority, the psychologist is not so. He is not required, nor is it necessary, for him ever to give orders to the patient or to anybody else. His advice may often be sought, but he never assumes authority. This often provides opportunities for the patient to work out his problems when he needs some non-authoritarian figure to consult.

When a psychologist is based on a ward in the way that has just been described, the sphere of his work is inevitably restricted, as he will be available for work only on the ward in which he is based. On the other hand, the value of his work is so much enhanced, and the fullness and richness of the psychological material he obtains is so much increased, that there can be no doubt of the value of this system of working. Unless his efforts are concentrated on a single ward the potentialities of the psychologist in the mental hospital setting may not be fully realized and he may get so little done that is really worth while that his usefulness may begin to be doubted. On the other hand, if his potentialities are exploited by putting him on the ward, his usefulness will become apparent.

At a time when mental illness and neurosis are becoming major concerns in national life, the increasing employment of clinical psychologists in this way may play a part in meeting some of the difficulties which at the moment beset work in mental hospitals.

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# NORMAL AND ABNORMAL BONE

## SYMPOSIUM AT QUEEN'S COLLEGE, DUNDEE

[FROM A SPECIAL CORRESPONDENT]

The properties of bone, its growth and repair, and some of its clinical abnormalities were among the subjects discussed at a symposium and postgraduate lecture held at Queen's College, Dundee, on September 5. The Master of Queen's, Professor D. R. DOW, opened the meeting.

### Breaking Stress

Professor G. H. BELL and Mrs. JEAN OLIVER (department of physiology, Queen's College) reported on the strength of bone in various pathological conditions. In Professor Bell's earlier studies it had been shown, they said, that the breaking stress of individual bones could be calculated from simple bending tests. The breaking stress was a measure of the quality of the bone material. In rats, while changes in the calcium intake might affect the size and therefore the strength of the bones, they did not alter the quality; similarly, pituitary, thyroid, and parathyroid hormones and oestrogens had little or no effect on bone quality. In rickets, however, the breaking stress was diminished in parallel with the reduction in the ash content of the bone, but apparently neither the bone's inorganic nor its organic constituents were altered. Recent studies with Mrs. Oliver on experimental lathyrism in rats had shown that in this condition bone quality was reduced even when there was no corresponding change in the quantity or quality of the inorganic component. At the end of this contribution Mr. I. S. SMILLIE asked why the breaking stress of a bone—for example, the neck of the femur—was reduced in old age. No answer to this conundrum could be found. One suggestion was that the explanation might lie in some variation in the connective tissue.

Dr. J. W. SMITH and Professor R. WALMSLEY (department of anatomy, St. Salvator's College) then discussed fatigue in bone. Dr. SMITH said that, while stress fracture from repeated strains during normal activity was a well-known clinical entity, previously it had never been proved experimentally that bone could be fractured in this way. He then proceeded to describe experiments in which stress fractures had been induced, illustrating in a film the apparatus used. He had found that the breaking stress was directly related to the elasticity of the bone being tested, and that the stress and static loads were the same for any given piece of bone. His experiments had been on dead bone, and so did not take into account any remodelling that might occur in the living subject.

Professor WALMSLEY took the matter a stage further by describing research he had carried out to correlate the elasticity of a bone with the collagen arrangement in its haversian systems. By means of stained sections he demonstrated that the collagen in a haversian system is disposed in alternate circular and longitudinal layers. He had taken a horse's radius, where the anterior cortex is under tension and the posterior cortex under compression, and calculated Young's modulus of elasticity for these two sections of the cortex. Section of the anterior surface of the bone, where the figure for the modulus was relatively high, showed the longitudinal fibres to be most marked, whereas section of the posterior cortex, which had a much lower modulus figure, showed the circular fibres to predominate. In the ensuing discussion Professor P. LACROIX asked if the sections had been examined under polarized light. Professor WALMSLEY said the findings were the same as those demonstrated by staining. The mineral content of bone was increased on the side under compression, he added.

### Growth and Repair

These aspects of the subject were discussed both in the symposium itself, where Mr. J. A. GILLESPIE (department of surgery, Queen's College) reported on his studies on the effect of nervous influences on bone growth, and in the open postgraduate lecture given after the symposium by Professor P. LACROIX (department of anatomy, Louvain), this year's praelector in the faculty of medicine at St. Andrews. Mr. GILLESPIE's experiments had led him to believe, he said, that neither the peripheral nor the autonomic nerves exerted any trophic action on bone. Nor did changes in blood flow to the limb alter the rate of growth. In a paralysed limb the quantity, not the quality, of the bone was affected. The basic rate of bone growth was due, he said, to the inherent growth energy of the cells of the epiphysial plate and inner layer of the periosteum, and this basic rate was increased by the stimulus of muscle action. In his view the degree of muscle paralysis in a limb was directly related to the subsequent shortening. If maximum use was made of a paralysed limb, the shortening would be reduced to a minimum. However, Mr. G. MITCHELL (Edinburgh), speaking on the basis of preliminary clinical observations, did not think the degree of paralysis in poliomyelitis could be related to the limb shortening. But he thought the paralysis of muscles whose origins were close to a rapidly growing epiphysis was an important factor in leading to serious shortening of a limb, and Miss M. FORRESTER-BROWN (Edinburgh) agreed with him, citing paralysis of the gastrocnemius as an example.

Professor LACROIX began by reviewing his experiments on the induction of bone growth. In normal epiphysial cartilage, he said, a layer of subperiosteal cartilage was laid down,

forming a perichondral ring which migrated with the epiphysis during the normal process of growth; and if epiphysial cartilage was transplanted into the renal capsule it would proliferate normally there also, producing a perichondral ring as well as new bone. Experimentally he had attempted to stimulate osteogenesis by using crude extracts of epiphysial cartilage, and in his hands osteogenesis had occurred in about 70% of the experiments. (Some workers, he said, had been unable to confirm his results; but perhaps a more elaborate extraction lessened the likelihood of success.) In order to confirm the presence of a stimulating factor in the cartilage, he had then implanted alcohol-killed epiphysial cartilage into the renal capsule, and his findings were the same as with fresh cartilage, except that proliferation and new bone formation were slower.

He next investigated the relative importance of periosteum and bone marrow in repair. His experiments showed that periosteum from a young rabbit would produce abundant new bone, that from an adult rabbit produced bone more slowly, while periosteum from a very young rabbit would produce cartilage as well as bone. Bone marrow implants would also produce bone in the renal capsule, but, unlike periosteal bone in this site, it gradually absorbed, possibly, Professor Lacroix thought, from lack of the application of Wolff's law. Cartilage from callus, he found, produced not only new bone but primary, secondary, and ultimately mature bone with a marrow-filled cavity. This occurred irrespective of whether the cartilage was fresh or alcohol-killed. Under similar experimental conditions costal cartilage was inert. From these experiments Professor Lacroix deduced that the trigger mechanism for osteogenesis lay, or at least was most abundant, in actively proliferating cartilage.

Finally Professor Lacroix discussed internal remodelling of a bone. With stained preparations, microradiographs, and autoradiographs after the administration of radioactive calcium and sulphur, he clearly demonstrated the tunnelling out of old haversian systems, the laying down of a preosseous layer in advance of calcium deposition, and the maturation of this newly deposited bone. He showed that this remodelling process affected only a very small fraction of the total haversian system and that it was most active in the metaphysis. Applying these experimental findings to the clinical picture of post-traumatic osteoporosis, he considered that the increased radio-translucency of the metaphysis in this condition was simply the result of remodelling. After fracture, remodelling occurred throughout the bone, but osteoporosis was most noticeable at the metaphysis because there the process was always most active.

### Ectopic Bone, Dyschondroplasia, and Osteochondritis Dissecans

Professor G. M. WYBURN (department of anatomy, Glasgow) spoke on ectopic bone formation. No satisfactory explanation of this would be forthcoming, he said, until biochemists determined the mechanism whereby apatite crystals were deposited, and the parts played by phosphatase, glycogen, and chondroitin sulphate. While certain experimental and pathological conditions could cause osteogenic metaplasia, bone transplants alone would induce the host tissue to produce new bone. Professor Wyburn then compared the osteogenic propensity of autogenous and homogenous implants in muscle. Even after the extrusion of a homogenous implant because of infection, new bone formed at the implantation site. Freezing or boiling an implant delayed osteogenesis, and treatment with alcohol inhibited it. The poor osteogenic response when bone implants were placed in the anterior chamber of the eye he ascribed to lack of reaction in the host tissue. Professor Wyburn ended by drawing the following conclusions: (1) The factor or factors which induce osteogenesis are not specific, as homogenous transplants are effective; (2) bone cells are not essential for the induction of osteogenesis; (3) the more immediate response to fresh autogenous grafts suggests that they contain a more abundant or more active induction factor than stored or prepared grafts. He thought the type of cell responsible for osteogenesis was of secondary importance to the local conditions produced by the cells in laying down a calcifiable intercellular matrix.

Mr. J. HUTCHISON (department of orthopaedics, Queen's College) described dyschondroplasia and metaphysial aclasis in two patients of the same age, and discussed the role of the periosteum in bone modelling with particular reference to its ability to control lesions in dyschondroplasia which penetrate the cortex, and its failure, possibly because of defect or rupture, to control the exostoses in metaphysial aclasis. He considered there was failure of ossification in the more central parts of the epiphysis in the former condition and at its periphery in the latter. Until more was known of the reasons for the failure in the growth pattern, little could be done for these patients except to remove exostoses which were interfering with function. Professor WYBURN asked about the appearance and fusion of the ossific centres of the epiphyses. There was a delay in their appearance, Mr. HUTCHISON said, but he did not know whether fusion with the metaphysis was delayed or not.

Mr. I. S. SMILLIE (department of orthopaedics, Queen's College) then reviewed the subject of loose bodies in joints, and in particular the condition known as osteochondritis dissecans. The reason for the separation of loose bodies had never been finally settled, he said, but he was strongly of the view that it could not be other than traumatic. The classical loose body always contained bone, sometimes a large fragment, and was often rough on its deep surface like coarse sandpaper. The separation therefore occurred not between the bone and the cartilage but in the superficial layers of the bone itself. If articular cartilage had no blood supply—and there was considerable evidence that an abnormal blood supply was detrimental to its welfare—the blood supply to the bone at its junction with the cartilage must be presumed to be minimal. If, then, there were circumstances in a joint which led to an area of articular cartilage being subjected to constantly recurring strain, a stress fracture would take place in the superficial layers of the adjacent bone. This stress fracture might affect a relatively small area, as in, say, the knee-joint, or a large proportion of the total joint surface, as in Freiberg's infraction of a metatarsal head. Mr. Smillie said the treatment he advocated was based on the fact that articular cartilage could live and proliferate in synovial fluid, but that the bony element of the loose body was dead. He showed examples of the practical application of these principles in preventing the separation of loose bodies and in restoring the articular surface when separation had occurred.

### Cancellous Bone in Grafting

Mr. I. M. STEWART (department of orthopaedics, Queen's College) gave a preliminary report on the use of prepared cancellous bone grafts. He said there was a wealth of literature on bone grafting, but this type of graft had not been mentioned. The preparation of the cancellous homograft was the same as for *os purum*—that is, water followed by ether extraction to remove blood, soluble protein, and fat. This altered the appearance and texture of the cancellous tissue, but such grafts fulfilled certain criteria for appositional replacement. These factors were a large surface area, permeability, and minimal denatured protein; they permitted the rapid penetration of the graft by host granulations, to a maximum depth of about three-quarters of an inch (2 cm.). Mr. Stewart then showed radiographs and clinical photographs of the graft site at an explorative operation to prove the efficacy of his material. Captain JAMES A. ENGLISH (Office of U.S. Naval Research, London) showed bone which had been deproteinized with ethylene diamine. Even as a heterogenous graft this chalk-like substance produced osteogenesis in experimental animals. He demonstrated the invasion of the graft by the host granulations by means of electron micrographs.

# Correspondence

*Because of heavy pressure on our space, correspondents are asked to keep their letters short.*

### Neonatal Umbilicus and Puerperal Infection

SIR,—Having worked for some years before the second world war on the problems of puerperal fever, I was greatly interested in the evidence brought forward by Drs. Joan M. Boissard and B. Eton (*Journal*, September 8, p. 574) and by Dr. W. Kwantes and Mr. J. R. E. James (p. 576) that the haemolytic streptococcus may sometimes become established in the nurseries of maternity units, and may be transmitted thence, directly or indirectly, to the mothers.

If my memory serves me aright, the cords were usually covered in those days by a dressing and a binder, and this danger may therefore have been somewhat less, but it certainly is a fact that, in spite of a careful search for the probable source of a mother's infection, we frequently failed to find one. It therefore seems to me quite possible —perhaps probable in view of the evidence now presented— that in some of these instances a baby's umbilicus, colonized by streptococci but showing no overt sepsis, may have been the unsuspected source.

These two reports in the *Journal*, together with that of Dr. Allan Gray[1] from the Central Middlesex Hospital, show that no fewer than 43 babies, which were or had recently been in the nurseries of four widely separated maternity units, were carrying haemolytic streptococci in the umbilicus. Those who were still in such nurseries undoubtedly constituted a potential source of puerperal infection.

Pending the publication of further data from other maternity units (which it is hoped will be forthcoming without much delay) it seems clear that the policy of leaving the cut surface of the cord uncovered should be reconsidered. On reflection it is not surprising that that cut surface, which is handled by several nurses as well as the mother, should sometimes become infected, or colonized, by haemolytic streptococci transmitted to it from an attendant carrying those organisms in the throat or nose or on the skin. Nor is it surprising that the streptococci so established on the cord of one baby should be quickly transferred to others in the nursery.

Since that is evidently a risk that must be reckoned with, there is clearly need for a routine treatment of the cord which has a proven prophylactic value against streptococcal infection. Happily recent work on burns has provided such a treatment—i.e., the local application of penicillin cream, which could easily be applied in the nursery. Jackson, Lowbury, and Topley,[2] in a carefully controlled clinical trial carried out in the burns unit of the Birmingham Accident Hospital, found that only 1.7% of 58 burned sites (in 27 patients) acquired a streptococcal infection after the prophylactic application of penicillin cream, as compared with 38% of 42 burned sites in 19 patients treated under identical conditions but without any penicillin cream. In view of that very clear-cut evidence, and my own day-to-day observation of hundreds of burns so treated, I have little doubt that if the severed cords are smeared generously with penicillin cream and then carefully covered with a dressing which is left undisturbed for 10 days or more, colonization by streptococci will be at most a rare event, and healing will take place normally.

The penicillin cream which was found effective in Birmingham contained 1,000 units per g. and it was made up in a "lanette wax" and castor-oil base. It should be kept in a domestic refrigerator at about 4° C. and small quantities issued as required. It is probable that penicillin powder in lactose would serve the purpose as well, but I am not aware that its effectiveness has been statistically established by a clinical trial. If prophylactic local application of penicillin is adopted it is probable that the need for systemic administration (for an umbilical infection) will very seldom arise.

The Birmingham experience, based on some 13,000 patients, has shown that the much-talked-of risk of allergic reaction to penicillin so applied is extremely small and may safely be ignored.—I am, etc.,

Farnham Royal, Bucks. LEONARD COLEBROOK.

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SIR,—We are prompted by the accounts of streptococcal umbilical infection by Drs. Joan M. Boissard and B. Eton (*Journal*, September 8, p. 574) and Dr. W. Kwantes and Mr. J. R. E. James (p. 576) to record a small outbreak in the Royal Berkshire Hospital.

Four cases of streptococcal septicaemia with osteitis occurred in babies in, or very recently discharged from, the obstetric nursery. Fortunately all recovered. Nose and throat swabs were taken from the medical, nursing, and domestic staff of the unit, and four nurses were found to be carriers of group A haemolytic streptococci. The four strains were sent to the streptococcus reference laboratory, and Dr. R. E. O. Williams, who kindly typed these and other strains, reported that two were type 2 and the other two type 28. Over a period of ten days umbilical swabs were taken from 21 babies, and of these no fewer than ten grew haemolytic streptococci. Five of these ten strains were typed and it was found that three were type 28 and two type 2. There was no naked eye evidence of inflammation in any of these cord stumps. A strain from a tibial abscess in one of the affected babies was also typed and found to be type 2. Bacteriological investigation of nursery floors, basins, weighing machines, and unused cord ligatures was negative.

As in other centres, routine cord care consisted of a simple tie with no dressing or antiseptic and no binder. This has now been replaced by the use of metal clips and a drying plastic spray. Moist areas after separation are swabbed with acriflavine in spirit. The routine nose and throat swabbing of new staff is more rigorously applied. We must agree that the trend towards simplicity in management of the cord had gone too far, but the unintentional experiment of providing these small, frequently exposed moist areas has been of value in showing us again, and only too clearly, the alarming manner in which infection can spread in an infant community.

Many of us feel that the traditional obstetric nursery with its neat rows of cocooned babies has very real dangers and disadvantages, one of which is the spread of infection, which is especially liable to occur when many of them are being attended to in a short period of time as in the early morning. Because of this—in addition to returning to a more detailed cord routine—it has seemed wise to continue our efforts to overcome objections to "rooming in," and to aim at the replacement of the traditional nursery by the recovery unit, in which, together with prematures, all damaged, asphyxiated, and abnormal babies are given temporary care. There would also be room to lodge the occasional well, but noisy, baby for the night. The much smaller numbers and the techniques and standards necessary in premature baby care would make epidemic infection much less likely.

We have been anxious about the babies. Drs. Boissard and Eton now show us that these nursery epidemics may lead to serious maternal infection. They are therefore a matter of close concern to the obstetrician as well as to the paediatrician.—We are, etc.,

J. J. KEMPTON.
Reading. T. D. M. MARTIN.

### Intracranial Aneurysm

SIR,—In his article "Intracranial Aneurysm: A New Method of Surgical Treatment," Mr. J. E. M. Dutton (*Journal*, September 8, p. 585) makes a number of statements in connexion with the material used that are difficult to understand and may prove misleading.

(1) "So far the self-curing acrylic, methyl-methacrylate, has been found most suitable." Methyl-methacrylate monomer will polymerize *spontaneously*, but so slowly as to be useless for the purpose indicated. The so-called "self-curing" acrylic resins contain not only methyl-methacrylate but also chemical activator systems designed to bring about rapid polymerization without the application of heat. The chemical activator systems employed in various brands of self-curing resins[1] vary widely in their properties, including the heat generated during polymerization, the degree of polymerization achieved, and their effects on the tissues. It would seem important to specify the type of self-curing resin employed.

(2) "Polymerization is complete in 15 to 20 minutes, and by that time the material has set quite firm." In a simple mixture of methyl-methacrylate monomer and polymer a "gel" or "dough" will be formed as a result of solution of the polymer powder in the monomer liquid, but unless the temperature is raised above about 60° C. no significant polymerization will occur.[2] If the material used by Mr. Dutton has set quite firm after 15 to 20 minutes, then presumably one of the chemically activated preparations is being used. However, the firm set does not indicate completion of polymerization; even after several hours as much as 1% of monomer may remain. This may be of importance when irritant effects come to be considered. If the material used is one which depends for its polymerization on benzoyl peroxide in the polymer powder, the proportion of residual monomer is likely to be even greater if the powder has been autoclaved, as advocated.

(3) "An acrylic compound was selected because . . . there is no shrinkage during polymerization. . . ." During polymerization methyl-methacrylate monomer undergoes a reduction in volume of approximately 21%. Of course, if the monomer is mixed with polymer powder, shrinkage of the mixture will be less than with monomer alone. This shrinkage may be within acceptable limits for a particular purpose, but there cannot be "no shrinkage."

(4) ". . . and there is neither clinical nor experimental evidence yet of any adverse local reaction to its presence." If, as I suspect, Mr. Dutton is using one of the chemically activated "self-curing" resins, then there is extensive evidence of their injurious effects on the tissues when used in certain other situations, even if there is no evidence of damage when used intracranially.[3–13]—I am, etc.,

London, W.C.1. IVOR R. H. KRAMER.

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## The Abuse of Antibiotics

SIR,—I am, in Stratford-on-Avon, sometimes privileged to look after visitors from across the Atlantic. It is most striking how many of them carry a comprehensive range of antibiotics as part of their luggage—sometimes with and sometimes without instructions on their use. Occasionally this modern form of travelling first-aid box has been the parting gift of some "well-wishing" family physician. Moreover, I do in fact find it is common practice for visiting Americans to have taken some form of antibiotic, usually oxytetracycline—be it for bowel infection, sore throat, common cold, or "chill"—before they call upon my services.

This seems to me one of the worst forms of the abuse of antibiotics. I cannot recall one instance of an antibiotic being correctly used by these self-treated patients. Either it was not indicated (which is practically synonymous with contraindicated), or, when indicated, the patient has been scared of using an adequate dosage. This is of course further evidence of the extent of the abuse of antibiotics. I would like to hope, however, that in this instance it has not arisen from any misunderstanding of the medical services, of antibiotics in particular, that are available to these very welcome guests to our country.—I am, etc.,

Stratford-on-Avon. E. O. EVANS.

## Medical Education

SIR,—I should like to draw further attention to a small item briefly mentioned in the valuable educational number of the *Journal* (September 1, p. 523), in point to the availability of annual summer schools abroad for British medical students, a benefit at present made use of by only a very small minority.

I have myself recently returned from one such course in Denmark, and in retrospect can appreciate something of the value obtained in observing the methods and ideas of another nation tackling fundamentally similar problems in both medical education and practice. In fact, I might go so far as to say that the informal discussions, the contrasts and comparisons, and the criticism, both objective and subjective, which inevitably mature in such a climate must surely play an integral part in the training of the "educated, thinking man" which the First World Conference on Medical Education appears to have agreed as being the aim of a Utopian teaching system.

The Danes fully realize the value of international contact at student level: a traditional scarcity of dissection material, which there is no attempt to remedy, enforces an annual exodus from the medical schools of Copenhagen and Aarhus during the summer vacation to a number of the other principal European universities, many reaching our own shores. To the Dane this is in fact a very definite stage in his education. Perhaps planners of the schooling of generations here to come might take yet one more note for future reference. —I am, etc.,

Oxford. D. M. HILL.

SIR,—In your issue of September 1 (p. 494) I find in the article by Dr. A. Morgan Jones the following statement: "In the days of pre-scientific medicine it was natural to regard anatomy as the basis of pathology and medicine. . . . Further, anatomy was the basis of the surgeon's training. . . . All this has changed, and physiological knowledge has become the basis of medical diagnosis and treatment and even of surgery." Furthermore, he states that inclusion of anatomy on its present scale in the medical curriculum "is a dreadful and stultifying waste of time for the average doctor."

I strongly disagree with this; for one thing, how can you get physiological results without the basic knowledge of the anatomy of the part being worked upon, and even the elementary knowledge of the whereabouts of the gland or organ it is desired to investigate? Another point, take a simple injury to the ankle. I cannot imagine approaching this without a knowledge of anatomy.—I am, etc.,

Virginia Water, Surrey. V. C. CAMERON.

## Preventive Medicine and the Medical Student

SIR,—May I draw special attention to Dr. C. M. Fletcher's excellent article on the teaching of social and preventive medicine, and especially to the heading "Diagnosis and Management of Social Factors in Disease" (*Journal*, September 1, p. 497)?

He asks, quoting Professor Leslie Banks, "Why is this patient here and how could his illness have been prevented?" This question has been in the minds of many for

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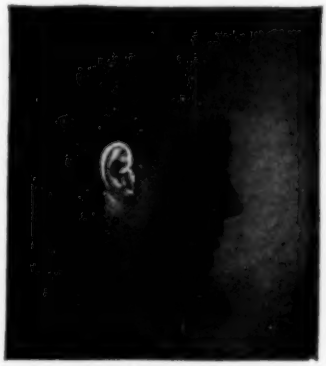

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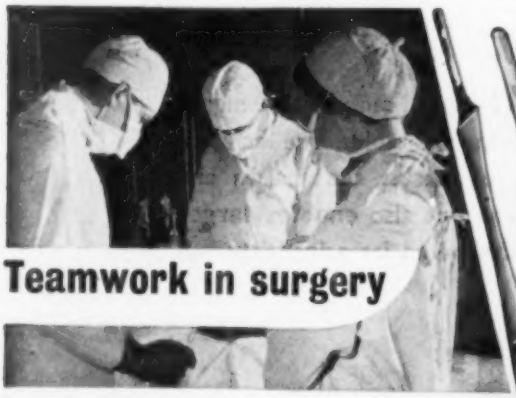

## Teamwork in surgery

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years. In 1919 Sir James Mackenzie established the Institute for Clinical Research "to investigate disease before the occurrence of any structural change in any organ of the body." Basing my knowledge on the inspection of Army recruits, civil appointments and insurance cases, inspection of school- and pre-school children, and from my experience as resident M.O. in several hospitals and as G.P. and M.O.H., I wrote in 1936,[1] "The investigation of disease in its early stages is one of the most valuable factors in prevention."

The medical curriculum has often been under review and criticism, and Dr. A. Morgan Jones (p. 494) goes so far as to write: "It is probable that the whole structure of the medical course should be reorganized." My contention is that the curriculum does not deal with *prevention* as a definite and distinct part of the final examination. The result is that the medical student is turned out pathologically minded and has not been trained so as to imbue a preventive-minded conscience.

I have very definite views on this. The Certificate of Public Health came to an end because it was not applied to the training of the medical student and was taken up only by the few interested in prevention.[2] I have advocated, and repeat without apology, that preventive medicine as a distinct subject should form part of the final examination and thus be placed on an equal footing with medicine, surgery, and obstetrics. Dr. Fletcher, referring to the recommendations of the General Medical Council, states: "A specialist in social and preventive medicine should be a member of the examining board." This specialist naturally should be a selected medical officer of health as the person skilled and engaged in this work in his official capacity. I have advocated that a medical officer of health should be included on the staffs of consultants in all teaching hospitals. There is a great opportunity here for teaching social and preventive medicine.[3] This has been backed up by the Guillebaud Committee. As the Diploma of Public Health is one of the higher qualifications I suggest it would be more in keeping with the special nature of the duties of the medical officer of health that the D.P.H. should be renamed Doctor of Public Health, and thus give the M.O.H. equal status to other specialists with higher qualifications in their specialty gained in postgraduate study.

I submit that future students must be trained to be competent to deal with the preservation of the health as well as the diseases of the family.—I am, etc.,

Southport. S. T. BEGGS.

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## Is Tonsillectomy Necessary?

SIR,—I am grateful to Dr. John C. Ryle (*Journal*, September 8, p. 603) for drawing my attention to M.R.C. Special Report No. 227.[1] Its contents are indeed relevant to the problem of tonsillectomy. I fear Dr. Ryle did not have time to read the whole document, for if he had he would have noticed that on page 124 is to be found not only the answer to my question but also so excellent and fair a summing up of the whole matter that I beg leave to quote it in full.

"Summarizing our experience set out above, we may say that there is no evidence whatever that *wholesale* tonsillectomy [my italics] results in a diminished incidence of the infections under discussion. The argument may be put forward that, if tonsillectomized boys and girls had not undergone the operation, they might have suffered more severely than they did, and the effect of the operation was to render them at least as resistant to infection as their unoperated companions. Since we have no means of knowing what would have happened in these circumstances, this argument is unanswerable. There is some slight indication that the incidence of rheumatism, otitis media, and mastoid disease is actually higher in the tonsillectomized group, but here again we do not know whether it might have been even higher in these individuals if tonsillectomy had not been performed.

"Hitherto we have been dealing with all the available data at our disposal, irrespective of when the operation was performed. It was considered advisable to examine in detail the experience of 364 boys in whom the tonsils were removed during school life, and for whom we had sickness records before and after operation. The details are set out in Table LVIII.

"It will be seen that for the nasopharyngeal group of infections, these boys before operation had an attack rate which was 8.7% greater than the expected rate obtained from the age-distribution and rates of all boarding schools combined. After tonsillectomy, however, the attack rate for nasopharyngeal infection was actually 0.5% less than the expected rate. Taking all sickness into account with regard to time lost, we find that this group of boys before operation lost one and a half days more than the average, but after operation they lost a quarter of a day less than the expected number. There is little doubt that in these boys the results of tonsillectomy appear to have been successful, particularly in causing a diminished attack rate of nasopharyngeal infection, but it must be remembered that probably the majority of these operations were performed on the advice of school medical officers who selected their cases with care.

"Few to-day would encourage the retention of diseased or obstructive tonsils, or would cast doubt on the real value of the operation in properly selected cases as demonstrated above; but it is a little difficult to believe that among the mass of tonsillectomies performed to-day (1938) all subjects for operation are selected with true discrimination, and one cannot avoid the conclusion that there is a tendency for the operation to be performed as a routine prophylactic ritual for no particular reason and with no particular result."

I can only add the observation the unnecessary tonsillectomy still seems to be unnecessary and that necessary tonsillectomy still seems to be necessary.—I am, etc.,

London, S.E.26. JOHN BURKINSHAW.

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## Gas Gangrene Risks

SIR,—Those who have had experience of war surgery will be critical of the views expressed by several correspondents blaming the presence of gas-forming organisms for the occurrence of gas gangrene in wounds. That this is not the direct cause has been proved repeatedly, since it is common to find such organisms in clinically healthy wounds. Simple facts are easily forgotten, but it will be calamitous if younger surgeons have to learn all over again the lessons of the last devastating war. The relation of pathogenic anaerobes to gas gangrene is straightforward: gas gangrene develops only in dead tissue. Hence the brilliant results following the teaching of Professor Trueta on correct wound excision, when war wounds remained clean after proper excision, even, though wounds were teeming with these organisms.

Our theatres and tools should of course be as germ-free as possible, but even more important is the practice of correct surgical principles.—I am, etc.,

Swindon. F. LOUIS.

## Torsion of Spermatic Cord

SIR,—May I comment on recent papers and letters on the clinical features of torsion of the spermatic cord by Mr. J. A. Baty (*Journal*, May 5, p. 1014), Mr. R. Burkitt (*Journal*, August 11, p. 345), and Dr. D. G. Chambers (*Journal*, September 1, p. 552)? There seems to be some diversity of opinion, as stated or suggested by these authors, regarding the position of true testicular pain. Some years ago I demonstrated,[1] and I like to think logically and conclusively, that pain produced in the testis is invariably situated in the early embryonic position of the organ—about the level of the internal abdominal ring—and not in the scrotum. Why? A simple illusion, determined by anatomical structure and permanently fixed early in pre-natal life. Later migration by normal development—e.g., of testis, appendix, diaphragm, etc., or artificial displacement as in Aristotle's experiment (crossed fingers) and pedicle skin transplants—can neither destroy nor correct the illusion when the original innervation is maintained.

In this connexion (the common observation and fact that pain is frequently situated at a distance from the tissue in which it is produced or excited) one is somewhat surprised

and perturbed to note that in some medical schools (*not* St. Andrews) students still trot out McKenzie's theory—viscero-cutaneous reflex—as the explanation for these distant pains. One wonders who is responsible, physiologists or clinicians, for perpetuation of this illogical and fantastic view, which is akin to the widespread belief in ventriloquism. Both I should say are anatomical and physiological impossibilities, and deserve decent and honourable interment—R.I.P.

Mr. Burkitt, quoting O'Conor,[2] writes, "The condition [torsion of spermatic cord] is probably much commoner than is generally realized, most cases . . . never being diagnosed at all." This is probably true, the reason being, as suggested by Mr. Tom McNair, Edinburgh (personal communication), that the unknowledgeable clinician ignores the testis (and its cord) as a possible cause of low abdominal pain. Hence the removal of many normal appendices with no relief of symptoms. "Them's my sentiments" (W. M. Thackeray, *Vanity Fair*).—I am, etc.,

Dundee. F. R. BROWN.

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## Rare Type of Anonychia

SIR,—We should be most grateful for an introduction to any family showing the dominant, inherited abnormality illustrated in the accompanying photograph. This condition is not seriously disabling except on those rare occasions when it is associated with ectrodactyly.

We have been making genetical linkage studies on a Rotherham family with this form of anonychia and more material is now required, so we hope that any practitioner who may have noticed the condition will communicate with us at the Galton Laboratory, University College, London, W.C.1.—We are, etc.,

SYLVIA D. LAWLER.
London, W.C.1. J. H. RENWICK.

## Inhaled Foreign Bodies

SIR,—Mr. C. L. N. Robinson and Dr. W. W. Mushin (*Journal*, August 11, p. 324) have rightly drawn attention to this important subject. As they say, foreign bodies are liable to inhalation, particularly by young children.

In 1954 I published an account in the *Journal* (January 16, 1954, p. 125) of three children who had inhaled radiotranslucent foreign bodies. In this account and in an annotation on the subject in the same issue (p. 144) the importance of bronchoscopy in the search for foreign bodies was stressed. In the last two years I have seen five more children who had inhaled radiotranslucent foreign bodies. In three of these the initial episode had been forgotten. All five presented with respiratory disorders ranging from "a slight wheeze" to signs of advanced lung sepsis that had not responded to chemotherapy. In one the chest *x*-ray was normal, though full inspiratory and expiratory films were impossible owing to the child's age. All had inhaled nuts, which were removed at bronchoscopy. In four they were peanuts, which seem to have a peculiar fascination for children and are presumably easily inhaled on account of their small size.

If a child is alleged to have "swallowed something down the wrong way" or, with something in its mouth, to have choked, gagged, or coughed, no effort should be spared to locate a foreign body by all methods, including bronchoscopy. Similarly, if a respiratory disorder in a child has not responded to usual treatment, even if a parent cannot remember any choking episode, the possible presence of a foreign body should not be overlooked.—I am, etc.,

Derby. BERNARD M. LAURANCE.

## Shoe-fitting

SIR,—While agreeing with Dr. W. G. Booth (August 25, p. 479) on the uselessness of the shoe-fitting fluoroscope, the need for trained shoe-fitters, and the high incidence of hallux valgus in teen-age girls, I cannot agree that this deformity is caused primarily by bad fitting of footwear. Bad fitting means the selection of the wrong footwear and therefore implies that correct footwear is available. This is not the case. Hallux valgus is caused by wearing wrongly designed footwear—footwear that causes angulation of the hallux at the metatarso-phalangeal joint.

If a 16-year-old girl with undeformed feet stands erect with her bare feet together, the big toes are in contact all along their inner border. When correctly shod the toes should be accommodated in exactly the same position. Footwear that cause the toes to point outwards cause deformity. My own work[1] has shown that slight deviations from the normal are important and can cause deformity. These principles of design are accepted by all the leading manufacturers of children's footwear. Shoes with straight inner borders are available in many makes in small sizes, but they are very rare in the late teen-age styles. One well-known brand of children's footwear shows a variation of nearly twenty degrees between the early and late teen-age styles, but all carry the same trade-mark and sales publicity. Correctly designed footwear for the adolescent and the adult is virtually unobtainable.

Why then do manufacturers depart from the principles of good design in teen-age styles? No reason is given, but, as the trend is most marked in girls' footwear, it seems that preparation for fashion footwear plays a large part. Fashion footwear is the trade's best money-maker, and this type of footwear is designed without regard for the shape or function of the foot and invariably deforms. For example, "low-cut shoes of 'court' type are necessarily deforming, for the pointed toe is essential to its security."[2]

To-day 75% of the girls leaving school have acquired hallux valgus because their shoes are badly designed and could never be correctly fitted. All hallux valgus is preventable, but first we must secure an adequate supply of correctly designed footwear, for until then neither shoe-fitter nor parent can play their part.—I am, etc.,

London, S.E.15. CHARLES A. PRATT.

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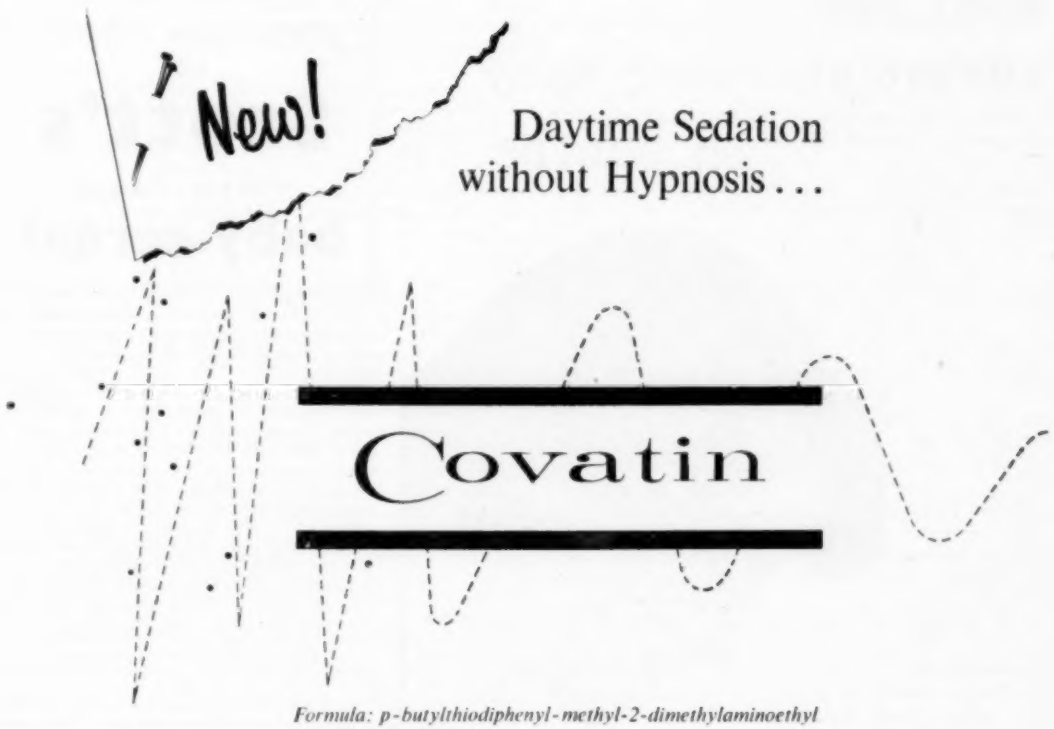
## Recurrence of Tetanus

SIR,—A Tamil girl, aged 3 years, was admitted to hospital on November 4, 1955, with a history of inability to open her mouth for three days, and generalized spasms, which had occurred several times a day for two days. There was a history of discharge from the right ear for one week.

On examination there was trismus, a risus sardonicus, and opisthotonos. No abnormality was found in the heart or lungs. The abdomen was tense. A diagnosis of tetanus was made and an intramuscular injection of 100,000 international units (1950) of tetanus antitoxin given on admission. Sedation was accomplished by the use of rectal paraldehyde and chloral by mouth. Elixir mephenesin and penicillin




*Formula: p-butylthiodiphenyl-methyl-2-dimethylaminoethyl sulphide hydrochloride.*

Everyday in the waiting room there are patients who can benefit from Covatin, the new anti-anxiety drug. Covatin can be prescribed with confidence—clinical trials have proved that it promotes tranquillity and release from tension without causing sleep or dulling of alertness. It is particularly suited to the ambulant patient and has no side-effects and is not habit-forming.

**INDICATIONS**

Anxiety and tension states, nervous disorders, depression and restlessness. Tension due to high blood-pressure, arteriosclerosis, or menopause, etc.

**Packaging**

Available as 50 mg. sugar-coated tablets in bottles of 50 and 500

**Dosage**

The therapeutic dosage is 1 tablet 5 times daily which should be taken with food, if possible.

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advise starting baby
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Twin-Pack, two cereals
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one container

INFORMATION
FOR DOCTORS & NURSES
ON

# Scott's
## TWIN-PACK
# baby-cereal

Scott's Twin-Pack feeds, protects, soothes and educates. It feeds because each ounce gives over 100 calories. It protects and soothes because it is fortified by the addition of Vitamin D, calcium and trace elements, whilst it also contains Vitamin $B_1$ which is associated with the development of healthy nerve tissues. Moreover, Scott's Twin-Pack is easily digested and assimilated. Finally, Scott's Twin-Pack helps to educate baby's taste and pave the way towards a full varied diet, because each of the two cereals has its own distinct flavour.

Scott's Twin-Pack consists of pre-cooked and prepared oats and wheat, each in a separate waxed paper container, within the specially protected outer pack. It accords perfectly with modern teaching of the early addition of solids and variety to a baby's diet.

**THE ANALYSES BELOW**
give you the full nutritional details:-

**OAT**

Scott's Baby Cereal—Oat consists of oat flour, malt extract, bone phosphate, dried yeast, salt, iron and ammonium citrate, manganese sulphate, copper sulphate and calciferol (Vitamin D.)

| | per cent. | | grm. per oz. |
|---|---|---|---|
| Fat (by acid hydrolysis) | 6.2 | Fat (by acid hydrolysis) | 1.76 |
| Protein (N x 6.25) | 11.2 | Protein (N x 6.25) | 3.18 |
| Carbohydrate | 72.3 | Carbohydrate | 20.53 |
| Mineral Matter | 2.4 | | mg. per oz. |
| Fibre | 0.6 | Iron | 5.0 |
| Moisture | 7.3 | Calcium | 120.0 |
| | per oz. | Phosphorus | 110.0 |
| Vitamin D | 600 I.U. | Trace Elements: Zinc | 1.0 |
| Vitamin $B_1$ (as Aneurin Hydrochloride) | 0.22 mg. | Copper | 0.1 |
| | | Manganese | 0.1 |

Calories 114 per oz.

**WHEAT**

Scott's Baby Cereal-Wheat consists of wheat flour, malt extract, wheat germ, bone phosphate, calcium carbonate, dried yeast, salt, iron and ammonium citrate, manganese sulphate, copper sulphate and calciferol (Vitamin D.)

| | per cent. | | grm. per oz. |
|---|---|---|---|
| Fat (by acid hydrolysis) | 2.0 | Fat (by acid hydrolysis) | 0.57 |
| Protein (N x 6.25) | 14.0 | Protein (N x 6.25) | 3.98 |
| Carbohydrate | 72.5 | Carbohydrate | 20.59 |
| Mineral Matter | 2.6 | | mg. per oz. |
| Fibre | 0.4 | Iron | 5.0 |
| Moisture | 8.5 | Calcium | 120.0 |
| | per oz. | Phosphorus | 100.0 |
| Vitamin D | 600 I.U. | Trace Elements: Zinc | 0.5 |
| Vitamin $B_1$ (as Aneurin Hydrochloride) | 0.17 mg. | Copper | 0.1 |
| | | Manganese | 0.1 |

Calories 106 per oz.

Scott's staff of fully qualified dieticians are always available to give information and advice on any particular problem of diet that may arise. Diet sheets from:-

Birth to 4 months 3 to 4 months to 1 year
1 year to 2 years

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were also given, while chloramphenicol drops were instilled into the ear. The discharge from the ear was negative for *Cl. tetani* on culture. The antitoxin was repeated in a dose of 30,000 units once daily for three days, commencing the day after admission. The child was discharged after seventeen days.

She was readmitted on March 8, 1956, with a history of generalized spasms, with inability to open her mouth, from the previous evening. The mother also mentioned that a discharge from the child's ear had been noticed three days previously. She had been in good health previous to this. On examination all the signs of tetanus were found. No discharge from the ears was seen. 100,000 units of antitoxin was given on admission, and 40,000 on the day following. In addition the usual treatment was given. The discharge from the ear was negative for *Cl. tetani* on culture. The child was discharged 20 days after admission. The child was seen again on August 28, 1956. She was found to be in good health, with no residual stiffness.

I must thank Dr. Stanley Silva for permission to report this case.—I am, etc.,

Colombo. TREVOR PHILLIPS.

### Swaphook Tenotomy

SIR,—I was asked to visit a lady who had walked into a woodshed and trod on a sickle. On examination I noticed a neatly placed half-inch (1.3-cm.) transverse cut one inch (2.5 cm.) above the back of the os calcis. The calf muscles on the same side looked preternaturally athletic, while at the classical point where Mrs. Achilles had grabbed her infant son my finger and thumb could be opposed by nothing more substantial than two layers of skin; and through this skin, by pushing it forward, one could palpate quite easily the back of the ankle-joint. Needless to add, my patient was unable to plantar-flex her foot. She received expert surgical treatment (not from me, of course), but it took all of six months to undo the damage done by that swaphook tenotomy. Now, however, I am glad to write she has made a complete recovery and is still on my list (N.H.S.).—I am, etc.,

Buxted, Sussex. W. R. E. HARRISON.

### Soya Flour in Infantile Eczema

SIR,—Dr. B. Isserlin's letter (*Journal*, September 1, p. 553) raises the question of an easy source of supply of soya flour. Soya Foods Ltd. supply a full-fat processed soya flour under the name "soyolk," which can be easily converted into soya bean milk. "One of the best methods to make soya milk from soyolk is to scald in boiling water in the proportion of 1 cup of soyolk to 5 cups of water, cool and strain through fine cheese cloth. The white opaque liquid is soya bean milk" (extract from leaflet).—I am, etc.,

London, N.W.10. FELIX S. BESSER.

### Old Students of University College London

SIR,—I should be grateful if you would grant me a little space in your columns to try and make contact with old students of University College London, of whom we calculate there must be some 30,000 either in this country or overseas. Unfortunately, we have got records of the careers and up-to-date addresses of only a very small proportion of this number. The college authorities are anxious to get in touch with old students, to invite them when possible to appropriate college functions, and on occasion to seek their advice. It is only when some honour, public appearance, or other matter is recorded in the press that the college can add to its records of the individual concerned.

The college authorities hope that old students will write, even just a postcard, to the secretary of University College London, Gower Street, London, W.C.1, giving their addresses, dates at college, and subjects studied, and will keep the secretary informed of changes of address.—I am, etc.,

London, W.C.1. IFOR EVANS.

# Obituary

## S. D. RHIND, *M.C.*, M.B., F.R.C.S., F.R.A.C.S.

Mr. S. D. Rhind, consulting surgeon to the Wellington Hospital, New Zealand, and a former editor of the *New Zealand Medical Journal*, died recently after an illness of several months' duration. He was 62 years of age.

Sydney Devenish Rhind was born at Christchurch in 1894, but was educated in England. From Berkhamsted School he went on to St. George's Hospital, qualifying M.R.C.S., L.R.C.P. in 1916. He entered the New Zealand Medical Corps immediately after qualification, and served with the 1st New Zealand Expeditionary Force. In 1918 he was awarded the Military Cross. After demobilization he returned to St. George's, where he held a number of house appointments, and graduated M.B., B.S. from London University in 1922. In the following year he was admitted a Fellow of the Royal College of Surgeons of England. He was elected a Fellow of the Royal Australasian College of Surgeons in 1937.

In 1924 Rhind went back to New Zealand and became assistant surgeon at the Wellington Hospital; later he was appointed full surgeon and ultimately consulting surgeon. For many years he was senior surgeon of the hospital, where he took a particular interest in the teaching of final-year students. He was appointed editor of the *New Zealand Medical Journal* in 1934, in succession to Sir James Elliott, under whom he had been assistant editor for three years. He occupied the editorial chair until 1939, when Dr. J. O. Mercer became editor. Rhind was an energetic editor and was responsible for a number of improvements in the *New Zealand Medical Journal* in the matter of both content and format. A member of the B.M.A. for nearly forty years, he was chairman of the Wellington Division in 1937–8; honorary secretary of the New Zealand Branch from 1940 to 1944; president of the Branch from 1945 to 1947; and in 1946 he returned to England to attend the Annual Representative Meeting as representative of the Branch. He married Miss Vera Anderson in 1924 and had two daughters.

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Dr. J. R. SLESSOR died with tragic and startling suddenness on June 3 at the age of 48. He was taken ill while attending a patient and died within a few hours. The elder son of Dr. R. A. Slessor, with whom he was in partnership, James Runcieman Slessor was born at Fraserburgh on March 2, 1908, and received his medical training at Aberdeen University, where he graduated M.B., Ch.B. in 1930. After holding resident appointments at the Royal Cornwall Infirmary, Truro, he became a ship surgeon for about two years. Before settling in practice with his father at Fraserburgh in 1938, he worked for several years as a locumtenent in carefully selected practices in many different parts of England and Scotland. This and his sea experiences were undoubtedly to his great advantage, for very few had such a full knowledge of cities and men as he had. During the second world war he served with the R.A.F., mostly overseas in North Africa and Malta, holding the rank of squadron leader. After his return, besides being engaged in a very busy practice, he took a great interest in the affairs of his native town, being a member of the local school management committee. A keen sportsman, he was a past captain of the local golf club. From the beginning of the National Health Service he was a member and vice-chairman of North Aberdeenshire hospitals board of management. Greatly interested in the welfare of ex-Service men, the work

he did for the Fraserburgh branch of the British Legion, of which he was chairman, was monumental. These were not all the interests of his very full and helpful life, and certain of his medical neighbours will miss, but remember with gratitude, his wonderful companionship on several long motor tours abroad. Dr. Slessor was a widower—his wife, a daughter of a Birmingham medical practitioner having died in 1948—and he is survived by a son and two daughters. —J. C. W.

DR. H. C. WRIGHT, who was in general practice at Newcastle-upon-Tyne for many years, died on August 28 at the age of 68. Henry Cecil Wright was born on February 10, 1888, and studied medicine at Manchester University, qualifying L.M.S.S.A. in 1913. After qualification he held resident appointments in hospitals in Macclesfield and elsewhere. Shortly after the first world war he settled in practice in Newcastle-upon-Tyne and was for many years in partnership with the late Dr. J. E. Basham. He soon built up a large practice and became very popular, for he was a good doctor of the old school and inspired confidence in his patients. One of the kindest and friendliest of men, he had a keen sense of humour and a genial, disarming smile. He was an active member of the British Medical Association and was elected to serve as chairman of the Newcastle Division in 1932–3. He was also an active member and secretary of the Medical Institute in Newcastle for many years. Dr. Wright took a great interest in football and cricket, especially the latter, which he played well himself in his younger days. Latterly he had taken up bowls. His passing has left a void which will be hard to fill and he will be missed by a host of friends and patients.—J. H. B.

DR. JOHN L. GAMMIE, junior depute medical officer of health for the City of Edinburgh, died suddenly on August 30 at the age of 52. He studied medicine at Aberdeen University, graduating M.B., Ch.B. in 1926 and two years later obtaining the D.P.H. with distinction. After graduation he held house appointments at Aberdeen Royal Infirmary, Woodend Hospital, Aberdeen, and the Aberdeen City Fever Hospital, returning to Woodend Hospital in 1930 as senior resident medical officer after a period in general practice in Aberdeenshire. He joined the Edinburgh public health department in 1932 as senior medical officer and depute tuberculosis officer, and was appointed junior depute medical officer of health for the city in 1937. On the outbreak of the second world war he willingly undertook the duties of medical officer in charge of the Edinburgh civil defence casualty service. He was appointed, in 1946, a part-time lecturer in the department of public health and social medicine of the University of Edinburgh, and he also held the post of lecturer in health education to the Moray House Training College for Teachers. As depute medical officer of health he made a particular study of environmental hygiene and infectious disease control and was frequently consulted by family doctors throughout the city.

H. E. S. writes: The sudden death of John Gammie has come as a rude shock to his many friends. He was a man with outstanding gifts of mind, and his wide knowledge of medicine and of affairs in general, together with a pawky Aberdonian wit, made him a clear, informative, and interesting lecturer and speaker and a most agreeable and entertaining companion and colleague. To those who knew him best, however, he will always be remembered as a loyal friend who inspired feelings of affection and regard of an unusual degree and depth. His personal qualities were not always revealed on short acquaintance, but all who worked with him were quick to recognize his generous nature and kindness of heart. Not many, however, knew of the help and service he gave quietly and unobtrusively to those who came to him in trouble or difficulty. For them he never spared himself in time, thought, or material assistance, and not a few present in the large congregation gathered to pay their last respects must have looked back with deep gratitude to the help and guidance given them by John Gammie when things seemed dark and hopeless.

Two colleagues write: With the untimely death of John Gammie, Edinburgh has lost a well-known personality and his colleagues a good comrade. At first meeting John Gammie's brusque, abrupt manner may have been something of a barrier to closer acquaintance, but those who came into more frequent contact with him learnt to appreciate what lay under the surface—kindliness, friendliness, a sense of humour, and a willingness to help. In his professional work he applied to every problem clarity of insight and common sense, and though he was ready to listen to others his decisions were his own and he carried them out in a practical way with his feet firmly on the ground. As a university teacher he was a clear and interesting lecturer and was equally effective with a lay audience, especially an audience of young people, for John Gammie had the "common touch." His knowledge and experience were great, both in the clinical and in the administrative fields of public health, and his interest was not confined to his profession alone. He had a considerable appreciation of the arts, particularly of literature, and his gift of quotation from the poets often surprised his acquaintances. His colleagues will miss him, and their sympathy goes out in full measure to his wife and young son.

# Medico-Legal

## DEATH AFTER STABBING

### HOSPITAL TREATMENT VINDICATED

A committee of inquiry has found that "exemplary" treatment was given at the Hull Royal Infirmary to Walter Beaumont, aged 27, after he had been stabbed by James Clinton, aged 21, a member of the U.S. Air Force. The Leeds Regional Hospital Board has accepted the committee's report and expressed full confidence in the Infirmary's medical and nursing staff.

On July 25 Clinton was convicted of the murder of Beaumont by stabbing him in the stomach. On August 21 the Court of Criminal Appeal quashed the conviction after exercising its power, rarely used, to hear fresh evidence.[1] Between the conviction and the appeal a doctor who had observed Beaumont's treatment in hospital communicated to Clinton's legal advisers his view that the bronchopneumonia from which Beaumont died resulted not from the stab wound but from the administration of tetracycline after the patient had shown himself to be intolerant to it, and from the injection of excessive amounts of fluid. At the appeal Dr. Keith Simpson, pathologist, London, and Mr. Guy Blackburn, surgeon, London, gave evidence in support of this view.

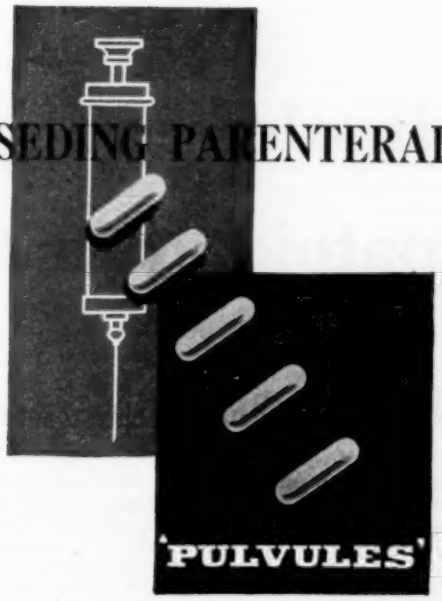
The Leeds Regional Hospital Board therefore set up a committee of inquiry, with three independent medical assessors, to inquire into Beaumont's case. The assessors were Professor J. H. Biggart, professor of pathology and dean of the faculty of medicine, Queen's University of Belfast, Professor J. Bruce, regius professor of clinical surgery, University of Edinburgh, and Dr. F. M. Parsons, assistant director of the Medical Research Council's surgical research unit, General Infirmary, Leeds. The following members of the medical staff from the Hull Royal Infirmary attended when the committee met on September 5: Mr. P. Walton, consultant surgeon, Mr. M. A. Morkos, surgical registrar, and Dr. A. J. Shillitoe, consultant pathologist.

The report of the medical assessors is as follows:

#### Report of Assessors

"At the invitation of the Leeds Regional Hospital Board, we attended an inquiry into the management and the circumstances connected with the death of Beaumont in Hull Infirmary on May 12, 1956. We were afforded every opportunity of perusing the case records, and statements of those

[1] *British Medical Journal*, September 1, p. 556.




SUPERSEDING PARENTERAL THERAPY

# PENICILLIN-V Lilly

THE *effective* ORAL PENICILLIN

Reports prove that Penicillin-V will give clinical results comparable with parenteral penicillin. The oral route is time-saving and painless. Blood levels are higher and more prolonged than with other oral penicillins. Penicillin-V is unique in that it is unaffected by the action of gastric acid. Whenever penicillin is indicated, Penicillin-V is the product of choice.

The average dose is one 125 mg. capsule four times daily, increased in severe infections.

'Pulvules' Penicillin-V Lilly each contains 125 mg. (200,000 units). Suspension Penicillin-V Lilly Paediatric, in bottles to make 60 cc. contains 62.5 mg. (100,000 units) per large teaspoonful.

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# Aspirin intolerance in rheumatoid arthritis

## BUFFERIN—the new, better-tolerated analgesic

**Most successful answer yet discovered** The latest report by the Joint Council Committee of the Medical Research Council and the Nuffield Foundation (on clinical trials of cortisone, ACTH, and other therapeutic measures in chronic rheumatic diseases) confirms the findings of the previous year. "At the end of two years, therefore, as previously reported at the end of one year, it appears that for practical purposes there is remarkably little to choose between cortisone and aspirin in the management of this group of patients." (British Medical Journal, 1955, **2**, 695.)

As aspirin is a far cheaper and less dangerous therapeutic agent it is obvious why practitioners prefer it to cortisone. But there is still the problem of aspirin intolerance which affects as many as 42% of arthritic patients. And Bufferin, the new analgesic which reduces gastric upset to a negligible minimum, is certainly the most successful answer yet discovered. (J.A.M.A., June 4, 1955, p. 387.)

**Far better tolerated — even by arthritics** Bufferin combines acetylsalicylic acid with the antacids aluminium glycinate and magnesium carbonate (gentle antacid agents which do not produce "acid rebound"), and is well tolerated—even by arthritics. In blind trials amongst arthritics with proven intolerance to ordinary aspirin, 70% had no gastric symptoms after taking large doses of Bufferin over periods of 4 to 16 months. (J.A.M.A., June 4, 1955, p. 387.)

**Acts twice as quickly as aspirin** Not only is Bufferin better tolerated by the stomach than ordinary aspirin, but its pain relieving ingredient is absorbed twice as quickly into the blood-stream. Trials show that on an average the 10-minute salicylate level after taking Bufferin was more than 20% higher than the 20-minute level after taking ordinary aspirin. (J. Amer. Pharm. Assoc. 1950, 39:21.)

**BUFFERIN HAS NO EQUIVALENT IN THE B.P. OR NATIONAL FORMULARY. THIS FULLY JUSTIFIES THE PRESCRIPTION OF BUFFERIN ON E.C.10**

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## ANTACID ANALGESIC

Formula: *Acetylsalicylic Acid 5 gr.: Aluminium Glycinate ¾ gr.: Magnesium Carbonate 1½ gr.*

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concerned in the care of this patient, and of discussing all aspects of this patient's treatment and death with the appropriate medical attendants. We were greatly impressed by the frankness of those discussions, and the readiness with which all our questions were carefully and scrupulously answered. We also had the advantage of examining the material and the histological preparations pertaining to the autopsy. We consider, therefore, that all the relevant evidence was placed at our disposal.

"Before enunciating the observations we wish to make, we want to place on record our opinion that Beaumont's treatment at Hull Infirmary was exemplary, and in particular, we wish to pay a tribute to the care and devotion shown by the surgical registrar, Mr. Morkos, who, at Mr. Walton's request, moved into residence in the hospital and stayed there, scarcely leaving the patient's side from the time his post-operative state took an obviously serious course.

"From our scrutiny of the post-mortem material and of the case records, we are able to make the following observations:

"(1) There is histological evidence of severe damage to the kidney tubules (lower nephron nephrosis), which could only have originated soon after his injury, and was sufficient to have resulted in death.

"(2) The autopsy showed extensive pulmonary lesions. These were septic in type, and vascular and perivascular in situation, indicating that they had resulted from the transport of small infected clots. The lesions contained coccal organisms, and there is no evidence of the presence of fungi or yeasts such as are sometimes seen in patients treated with antibiotics.

"(3) Early meningitis was demonstrable at autopsy, and we regard this as further evidence of a blood-borne infection.

"(4) Death was hastened by the development of a catastrophic post-operative enteritis. We have carefully considered the relationship of this to the administration of terramycin. We are aware that this complication sometimes arises in patients treated with terramycin and other broad spectrum antibiotics, but in these cases the cause of enteritis can be established as due to antibiotic-resistant staphylococci rather than to any inherently poisonous property of the drugs. In the present case, culture of the stools failed to yield staphylococci, and we must therefore regard the cause of the enteritis as an open question, since a similar and fulminating enteritis sometimes occurs after operations, especially on the abdomen, without any antibiotic therapy. In one view, the latter type of post-operative enteritis is the sequel to a period of low blood pressure, and the occurrence of hypotensive lesions in the kidney lends support to such a possible explanation in this case.

"(5) The use of terramycin initially in Beaumont's case was in our opinion not incorrect, and there is good evidence of its value in the treatment of peritonitis. Its withdrawal at the onset of diarrhoea was correct. By this time, the patient had developed a fulminating gastro-enteritis as well as chest lesions, and these did not respond to penicillin. It was possibly unwise of the resident surgical officer to resort again to terramycin; but since there was reasonable doubt about the cause of the enteritis, and since the patient was gravely ill and febrile despite the administration of penicillin, the renewal of terramycin therapy was not unreasonable and certainly not blameworthy. In any event, the small quantity of terramycin which was then administered had no influence of any kind on the outcome of the case. We believe, in fact, that before the second course was started, the patient's state was irreversible.

"(6) It seems to us that the management of the fluid-electrolyte state should be considered in relation to three periods of the man's illness.

(*a*) *In the pre-operative and operative period*, the management of the fluid-electrolyte situation in our opinion was adequate.

(*b*) *In the early post-operative phase*, the control of the fluid therapy was appropriate.

(*c*) In the late post-operative period, following the development of severe enteritis complicated by serious renal impairment and by lung infection, a highly complicated biochemical disturbance developed. The fluid loss from the bowel was enormous and resulted in profound dehydration, one evidence of which, apart from the careful clinical observations of Mr. Morkos, was the concentration of haemoglobin in the blood (114%). As soon as possible Mr. Morkos enlisted the aid of the hospital biochemist, who thereafter performed daily estimations on which the day-to-day administration of fluids was based. The amount of fluid administered may appear large to those unfamiliar with the management of severe gastro-enteritis or cholera, which this man's diarrhoea resembled. It was perhaps fortunate that Mr. Morkos had had some experience of the treatment of cholera, and had the courage to apply this experience in the management of this extremely difficult case. That the amount of fluid given was in no way excessive is borne out by the absence at autopsy of the usual findings of overhydration, as, for example, oedema of the lungs, fluid in the serous cavities, or generalized dropsy.

"It is our impression that Beaumont was on the point of death on the fifth post-operative day when, in view of the gravity of his condition, a surgeon of Mr. Walton's experience found it necessary to advise the police authorities to take a dying deposition. The fact that he survived for a further three days was due, in our opinion, to the energetic and competent measures adopted by the staff of the hospital. In the event, and in the light of all the evidence, however, this man's life was unsavable and his death was not in any way attributable to the treatment he received in hospital."

### Full Vindication

The medical members of the Board present, after hearing the report of the assessors, endorsed it without reservation. In the opinion of the members present at the inquiry the report provided a full vindication of the staff of the Hull Royal Infirmary, and they requested that the following should be made known to the Board:

"(1) Whilst a patient at the Hull Royal Infirmary, the deceased man was treated by a medical team consisting of a consultant surgeon, a surgical registrar, a resident surgical officer, and a house-man. The direct responsibility for the patient at all times vested in the consultant surgeon. Three days before the patient died, the surgical registrar, a Fellow of the Royal College of Surgeons, voluntarily agreed to leave his home and family in Hull and to take up residence at the Infirmary in order that he could give the most constant and close attention to the patient, thus removing all onus of responsibility from the more junior members of the medical team.

"(2) In addition to the normal nursing staff on duty in the ward a special nurse was assigned to the patient, who was under constant nursing attention up to the time of his death."

# Vital Statistics

### Week Ending September 8

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 253, whooping-cough 2,315, diphtheria 4, measles 1,092, acute pneumonia 171, acute poliomyelitis 105, dysentery 330, paratyphoid fever 8, and typhoid fever 15.

### Infectious Diseases

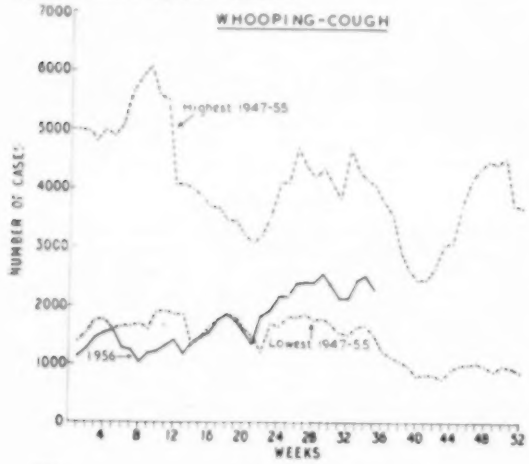
A further fall was reported in the incidence of infectious diseases in England and Wales during the week ending September 1. The decreases in the number of notifications included 484 for measles, from 1,866 to 1,382, 233 for whooping-cough, from 2,515 to 2,282, 75 for dysentery, from 379 to 304, 53 for acute poliomyelitis, from 177 to 124, and 27 for food-poisoning, from 247 to 220.

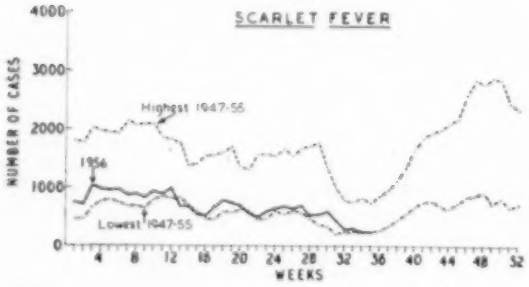
The largest falls in the incidence of measles were 56 in Staffordshire, from 76 to 20, 46 in Cornwall, from 111 to 65, and 44 in Norfolk, from 71 to 27. The largest decrease in the incidence of whooping-cough was 34 in Durham, from 110 to 76. Five cases of diphtheria were notified, being 4 more than in the preceding week. 246 cases of scarlet fever were notified, 1 more than in the preceding week, and there were no large fluctuations in the local returns.

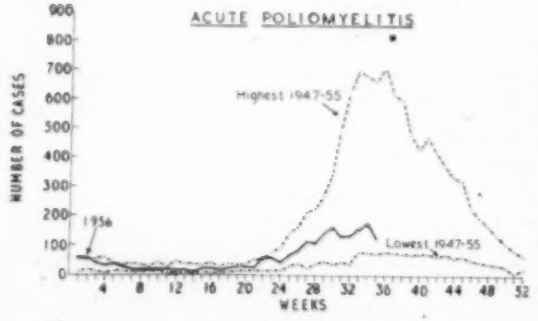
The number of notifications of dysentery was the lowest for two years. The largest returns were Lancashire 59 (Liverpool C.B. 16), London 33, Yorkshire West Riding 33 (Leeds C.B. 14), and Middlesex 20.

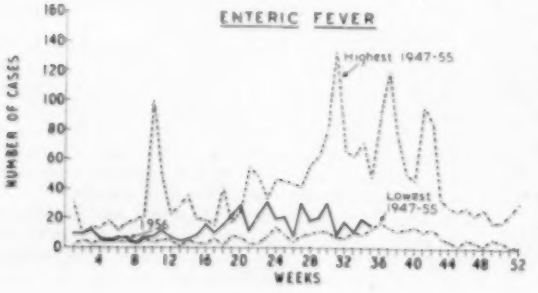
### Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1947–55 are shown thus ------, the figures for 1956 thus ———. Except for the curves showing notifications in 1956, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.




## INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **September 1** (No. 35) and corresponding week 1955.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

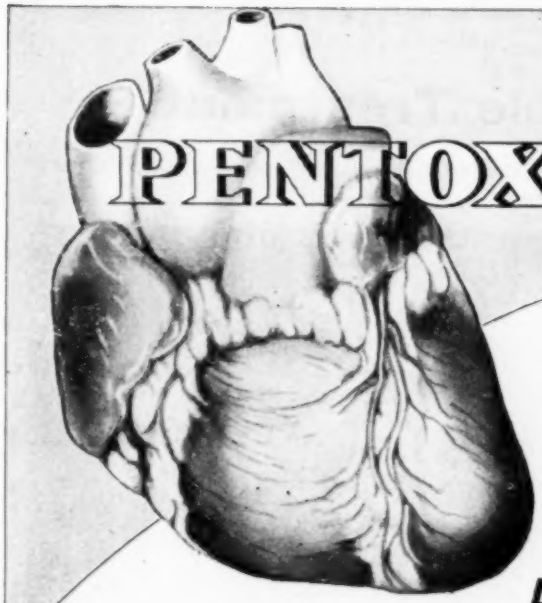
A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

| CASES in Countries and London | 1956 Eng. & Wales | 1956 Lond. | 1956 Scot. | 1956 N. Ire. | 1956 Eire | 1955 Eng. & Wales | 1955 Lond. | 1955 Scot. | 1955 N. Ire. | 1955 Eire |
|---|---|---|---|---|---|---|---|---|---|---|
| Diphtheria | 5 | 1 | 2 | 0 | 2 | 6 | 0 | 3 | 0 | |
| Dysentery | 304 | 33 | 152 | 8 | 1 | 400 | 53 | 240 | 11 | 4 |
| Encephalitis, acute | 1 | 0 | | 0 | | 4 | 2 | | 0 | |
| Enteric fever: | | | | | | | | | | |
| Typhoid | 9 | 2 | 0 | 0 | 6 | | | 0 | 0 | |
| Paratyphoid | 6 | 0 | 4(B) | 2 | 1(B) | 34 | 10 | 3 | 3 | |
| Food-poisoning | 220 | 13 | | 0 | | 560 | 58 | | 0 | |
| Infective enteritis or diarrhoea under 2 years | : | | | 12 | 25 | | | | 38 | 161 |
| Measles* | 1,382 | 172 | 53 | 19 | 50 | 2,618 | 58 | 23 | 17 | 27 |
| Meningococcal infection | 26 | 1 | 13 | 1 | 1 | 21 | 1 | 9 | 0 | |
| Ophthalmia neonatorum | 21 | 0 | 5 | 0 | | 36 | 2 | 0 | 1 | |
| Pneumonia† | 175 | 6 | 126 | 1 | | 179 | 6 | 91 | 3 | |
| Poliomyelitis, acute: | | | | | | | | | | |
| Paralytic | 53 | 4 | 11 | 0 | 23 | 206 | 28 | 53 | 0 | 4 |
| Non-paralytic | 71 | 4 | | | | 192 | 26 | | | |
| Puerperal fever§ | 185 | 34 | 12 | 1 | | 216 | 38 | 13 | 0 | |
| Scarlet fever | 246 | 17 | 57 | 12 | 12 | 228 | 20 | 48 | 10 | 12 |
| Tuberculosis: | | | | | | | | | | |
| Respiratory | 481 | 51 | 102 | 17 | | 599 | 60 | 133 | 17 | |
| Non-respiratory | 72 | 7 | 18 | 7 | | 76 | 6 | 17 | 3 | |
| Whooping-cough | 2,282 | 190 | 345 | 28 | 31 | 1,511 | 63 | 67 | 109 | 76 |

| DEATHS in Great Towns | 1956 Eng. & Wales | 1956 Lond. | 1956 Scot. | 1956 N. Ire. | 1956 Eire | 1955 Eng. & Wales | 1955 Lond. | 1955 Scot. | 1955 N. Ire. | 1955 Eire |
|---|---|---|---|---|---|---|---|---|---|---|
| Diphtheria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Dysentery | 0 | 0 | 1 | 0 | | 1 | 1 | | 0 | |
| Encephalitis, acute | | 0 | | | 0 | | 0 | | | 0 |
| Enteric fever | 0 | 0 | 0 | 0 | | 1 | 0 | 1 | 0 | |
| Infective enteritis or diarrhoea under 2 years | 3 | 0 | 0 | 0 | 1 | 3 | 0 | 2 | 0 | 2 |
| Influenza | 5 | 0 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 |
| Measles | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Meningococcal infection | | 1 | 0 | | | | 0 | 0 | | |
| Pneumonia | 144 | 24 | 10 | 8 | 4 | 147 | 19 | 6 | 5 | 0 |
| Poliomyelitis, acute | 2 | 0 | | | 0 | 6 | 2 | | | 0 |
| Scarlet fever | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Tuberculosis: | | | | | | | | | | |
| Respiratory | 48 | 3 | 3 | 2 | 2 | 57 | 7 | 4 | 3 | 1 |
| Non-respiratory | | 0 | 0 | 0 | 0 | | 2 | 0 | 1 | 1 |
| Whooping-cough | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Deaths 0–1 year | 182 | 26 | 25 | 2 | 6 | 190 | 27 | 28 | 4 | 9 |
| Deaths (excluding stillbirths) | 4,369 | 631 | 511 | 92 | 152 | 4,112 | 574 | 446 | 67 | 131 |
| **LIVE BIRTHS** | 7,307 | 1042 | 867 | 198 | 360 | 7,044 | 1049 | 807 | 252 | 320 |
| **STILLBIRTHS** | 216 | 38 | 16 | | | 172 | 16 | 31 | | |

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.



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**for**

## Angina Pectoris

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Although some patients will still occasionally require glyceryl trinitrate, in many others 'Pentoxylon' will provide complete relief from anginal attacks. It will also bring: "*gratifying reduction of anxiety and relief of apprehension . . .*"

North-West Med. (1955) 54: 34

*Dose:* 1 tablet four times a day, before meals, increased later if necessary.

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# Medical News

**Melanocyte-stimulating Hormone.**—In a letter to the September 5 issue of the *Journal of the American Chemical Society* Professor C. H. LI and his colleagues at the hormone research laboratory at California University report the isolation of pure melanocyte-stimulating hormone (intermedin) from the posterior lobe of pigs' pituitary glands. They also report the hormone's structural formula: it is a peptide consisting of 18 amino-acids, with a minimum molecular weight of 2,177. In their formula, Professor Li and his colleagues point out, one sequence of seven amino-acids in it "also occurs, identically, in all the corticotrophins that have been studied hitherto." This, they suggest, in all probability explains the intrinsic melanocyte-stimulating activity of pure corticotrophin preparations. In the corticotrophin molecule, they continue, "this central sequence apparently acquires, by virtue of a different specific order of amino-acids on each side of it, an adrenal-stimulating activity as well."

**25th Anniversary at Welsh National School of Medicine.**—Next month the Welsh National School of Medicine is celebrating the 25th anniversary of the granting of its charter in 1931. This constituted the Welsh National School of Medicine, in its present form, as the clinical school of the University of Wales. On October 12 Professor JETHRO GOUGH, professor of pathology in the School and director of the Institute of Pathology, himself a past student of the School, will deliver the opening address of the session to the students. This is a break with tradition to mark the occasion, as the speaker is usually a visitor. In the evening there will be an anniversary dinner at the City Hall. On October 12 and 13 all the departments of the School and the preclinical departments at University College will be open to past students and visitors. Special exhibitions are being arranged in the departments. If any past students of the Welsh National School of Medicine wish to attend the dinner, and have not so far received an invitation, they should communicate at once with the Secretary of the School, Mr. F. DODSWORTH, at 34, Newport Road, Cardiff.

**"Student's Guide to London."**—The National Union of Students has produced a first-rate guide for the 10,000 new students arriving in London this year. A limited number of copies are available to others, at 2s. net, from the N.U.S., 3, Endsleigh Street, London, W.C.1. The guide gives advice on such practical topics as lodgings and travelling in London, how to make the money go round, vacation work, and where to find inexpensive food and entertainment, the latter ranging from a visit to the House of Commons, sport, or the theatre, to jazz and drinking clubs. Much else of value to the student—and his elders—is included, both serious and gay. Thanks to the generous support of advertisers, the guide is free to the new students for whom it is primarily intended.

**Cruelty to Children.**—The scale of operation in Britain of the National Society for the Prevention of Cruelty to Children may not be generally appreciated. During the year ended February 29, 1956, the society dealt with 36,697 cases involving 98,277 children, of whom about 43% were under school age. The types of case were: neglect (22,097), assault or ill-treatment (3,624), moral danger and immoral offences (805), "beyond control" (524), abandonment (67), "exposure or causing to beg" (47), unregistered foster children (39); in addition aid or advice was sought in 9,494 cases. The society relatively seldom prosecuted: only 840 cases were prosecuted or brought before Juvenile Courts, whereas nearly 35,000 cases were dealt with by warning or advice. In its annual report the society draws attention to two problems of particular importance: the failure to report known cases, and the widespread existence of mental cruelty to children. "In almost every bad case which we handle," states the society, "it is borne in upon us that someone must have known what was happening but failed to speak and so connived at the continuance of sufferings which could have been prevented. To meet this worrying problem we proclaim as widely as possible that the society never divulges the names of its informants unless malice is proved." Mental cruelty is stated to pose probably the greatest current problem confronting those working for the happiness and welfare of children. Anyone knowing of a child who is being ill-used or neglected; or who is being denied necessary medical treatment through the negligence of its parents; or of a parent who is worried about any matter concerning his or her children and needs advice, is asked by the society to communicate with the director, N.S.P.C.C., Victory House, Leicester Square, London, W.C.2 (Telephone: Gerrard 2774), or with any of the society's local offices. All further steps are then taken by the society.

**Queen's University, Belfast.**—Dr. J. G. GIBSON, senior lecturer in psychiatry at the London University Institute of Psychiatry, has been appointed to the newly created Chair of Mental Health at Queen's University, Belfast. Dr. Gibson graduated M.B., B.Ch. at Belfast in 1942, proceeding M.D. in 1947. He obtained the M.R.C.P. (London) in 1949, and the D.P.M. (England) in 1954. Among his appointments he has held posts as assistant resident in psychiatry at the Massachusetts General Hospital, Boston, and teaching fellow in psychiatry at the Harvard Medical School. Dr. Gibson is also honorary consultant at the Bethlem Royal and Maudsley Hospitals. Dr. I. J. CARRÉ, medical registrar at the Children's Hospital, Birmingham, has been appointed to a lectureship in child health at Queen's University.

**Chair of Pathology at Dalhousie.**—Dr. W. A. TAYLOR, formerly lecturer in the department of pathology at Glasgow University, has been appointed to the Chair of Pathology at Dalhousie University, Halifax, Nova Scotia, and director of the pathology division of the Nova Scotia Department of Public Health. After graduating B.Sc. at Glasgow University with first-class honours in physiology in 1942, Dr. Taylor was elected to a Rockefeller studentship in America. On his way there he was torpedoed off Newfoundland and set ashore by a corvette at Halifax. In America he spent a year at Stanford University Medical School, San Francisco, and two years at Cornell University, New York. On his return to Glasgow in 1945 he graduated in medicine, and joined the staff of the university pathology department at the Western Infirmary, where he remained until March, 1955, when he left to become associate professor at Dalhousie.

**Contact with Poland.**—At the request of the Polish Ministry of Health the British Council has arranged for Sir ROBERT MACINTOSH, Nuffield Professor of Anaesthetics at Oxford, and Professor IAN AIRD, director of the surgical unit at the Postgraduate Medical School of London, to visit Poland next month. This is the first visit of its kind to Poland for some years. Sir Robert Macintosh will arrive there on October 6, after a three-weeks visit to Moscow at the invitation of the Medical Academy and the Soviet Ministry of Health, to be the guest of the Polish College of Surgeons until October 18. He will be joined by Professor Aird on October 19, and they will then lecture for ten days in Warsaw. An exhibition of British medical books and periodicals will be shown in Warsaw during their visit.

**W.H.O. Regional Director for Europe.**—Dr. P. J. J. VAN DE CALSEYDE, director-general of health at the Belgian Ministry of Health, was nominated by the World Health Organization's regional committee for Europe on September 12 for the office of regional director for Europe. This post fell vacant on the death of Dr. NORMAN D. BEGG last May.

**Good-bye to the Sanitary Inspector.**—For the last time sanitary inspectors met this week at their association's annual conference, this year at Bournemouth, under their old title.

By the Sanitary Inspectors (Change of Designation) Act, 1956, which took effect last month, their title has been changed to Public Health Inspector.

**Memorial to James Bridie.**—At the Glasgow Citizens' Theatre on September 17 Mr. J. B. PRIESTLEY unveiled a bronze plaque in memory of JAMES BRIDIE (Dr. O. H. MAVOR), the Glasgow physician and playwright, who founded the theatre. The ceremony was presided over by Dr. T. J. HONEYMAN, and the playwright's son, Dr. RONALD MAVOR, also a physician in Glasgow, proposed the vote of thanks.

**Ciba Foundation.**—Sir RUSSELL BRAIN, President of the Royal College of Physicians, has been appointed a trustee of the Ciba Foundation.

**Visiting Professor at Birmingham.**—Professor WALTER BAUER, Sterling professor of clinical medicine at Harvard, and physician-in-chief at the Massachusetts General Hospital, will be visiting professor of medicine at Birmingham University during October.

**Dr. Nora Wattie,** principal child welfare medical officer of Glasgow Corporation, was elected president of the Royal Sanitary Association of Scotland at the association's annual meeting in Montrose on September 17.

## COMING EVENTS

**Ministry of Supply.**—Medical Services Exhibition, illustrating aspects of occupational health as applied at the Ministry's research and other establishments, will be held at the Pillar Hall, Board of Trade/Air Ministry Building, Whitehall, London, S.W.1, September 24–28, from 10 a.m. to 6 a.m.

**Middlesex Hospital Medical School.**—Annual dinner for past and present students will be on September 28 at 7 for 7.30 p.m. at the Savoy Hotel. Mr. F. W. ROQUES will be in the chair. The usual "Refresher Course" for past students will be held from September 28 to 30. Details from the medical school secretary, Middlesex Hospital, London, W.1.

**Royal College of Obstetricians and Gynaecologists.**—An admission ceremony will be held on September 28 at 3.30 p.m. in the College House, 58, Queen Anne Street, London, W.1, when Viscount NUFFIELD and Lord WEEKS (formerly Sir Ronald Weeks) will be admitted to the Honorary Fellowship of the College.

**National Smoke Abatement Society.**—Annual conference at Southport, October 3–5. Sir HUGH BEAVER will deliver the Des Vœux memorial lecture on "Clean Air: The Next Step." Details from the society, Palace Chambers, Bridge Street, London, S.W.1.

**Mongolism.**—A meeting to discuss current research on mongolism will be held at the Fountain Hospital, Tooting Grove, London, S.W.17, on October 3 at 5.30 p.m. The speakers will be Professor L. S. PENROSE, F.R.S., Dr. C. O. CARTER, and Dr. U. MITTWOCH. All interested are invited.

**Association of Clinical Pathologists.**—Fifty-seventh general meeting will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, October 4–6. On October 6 there will be a joint meeting with the Association of Clinical Biochemists. The dinner (25s.) will take place on October 5. Details from Dr. J. N. CUMINGS, National Hospital, Queen Square, London, W.C.1.

**London County Medical Society.**—A meeting of the Society will be held at 5.30 p.m. on October 4 at the County Hall, Westminster Bridge, London, S.E.1. The society will be addressed by Sir CLEMENT PRICE THOMAS, and his subject will be "Carcinoma of the Lung." Members of the Association of Industrial Medical Officers, the Middlesex County Medical Society, and members of the London Divisions of the B.M.A. are invited.

**Institute of Diseases of the Chest.**—Clinical demonstrations arranged will be held in the lecture room of the Institute, Brompton, London, S.W.3, on Fridays at 5 p.m., from October 5 to December 14. Open, without fee, to medical practitioners.

**Yorkshire Association of Graduates of Glasgow University.**—Annual dinner at the Great Northern Hotel, Leeds, October 6 at 7.30 p.m. Details from Mr. J. WISHART, F.R.C.S.Ed., 33, Manor Row, Bradford, 1.

## NEW ISSUES

**Archives of Disease in Childhood.**—The new issue (Vol. 31, No. 158) is now available. The contents include :

FREE DIETS IN THE TREATMENT OF DIABETIC CHILDREN. Constance C. Forsyth and W. W. Payne.
A CLINICAL AND BIOCHEMICAL STUDY OF GALACTOSAEMIA. G. M. Komrower, V. Schwarz, A. Holzel, and L. Goldberg.
ADDISON'S DISEASE IN INFANCY. Alan Williams and M. J. Robinson.
FIBROCYSTIC DISEASE OF THE PANCREAS IN AN ADOLESCENT WITH MINIMAL PULMONARY INVOLVEMENT. R. C. King.
ACUTE PANCREATITIS IN CHILDHOOD. Edwin Haigh.
SYMPTOMATIC PANCREATIC HETEROTOPIA OF THE PYLORUS ASSOCIATED WITH BILATERAL RENAL CORTICAL NECROSIS IN AN INFANT. R. J. Kernohan and J. Edgar Morison.
PATENT DUCTUS ARTERIOSUS. J. D. Hay and O. C. Ward.
HYDROCEPHALUS ASSOCIATED WITH OBLITERATION OF THE LONGITUDINAL SINUS. J. L. Emery and R. B. Zachary.
CONGENITAL FACTOR VII DEFICIENCY. H. B. W. Greig, H. C. Falcke, M. Simon, and H. Cohen.
HAEMOLYTIC DISEASE OF THE NEWBORN DUE TO ANTI-DUFFY (Fy$^a$). J. B. Baker, David Grewar, Marion Lewis, Hiroko Ayukawa, and Bruce Chown.
THE INTELLIGENCE OF CHILDREN WITH CLEFT PALATE. R. S. Illingworth and L. B. Birch.
A PATHOLOGICAL STUDY OF FIVE CASES OF PYELONEPHRITIS IN THE NEWBORN. K. A. Porter and M. McC. Giles.
THE MORBID ANATOMY OF INFANTILE MALNUTRITION IN CAPETOWN. J. A. H. Campbell.
ACUTE NECROTISING RHEUMATIC ARTERITIS IN A CHILD. A. T. Sandison.
LEAD POISONING IN CHILDHOOD TREATED BY THE SUBCUTANEOUS ADMINISTRATION OF A CHELATING AGENT. N. V. O'Donohoe.
A CASE OF ATRESIA OF THE LARYNX. N. E. Rankin and I. R. Mendelson.
INTRATHECAL ISONIAZID IN TUBERCULOUS MENINGITIS. P. N. Swift.
BOOK REVIEWS.

Issued six times a year; annual subscription £3 3s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

## SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

### Monday, September 24

LONDON UNIVERSITY.—At Royal Free Hospital School of Medicine, 5.15 p.m., special university lecture in physiology by Professor J. H. Comroe (Pennsylvania): Pulmonary Function: Tests and Interpretation.

### Tuesday, September 25

LONDON UNIVERSITY.—At Royal Free Hospital School of Medicine, 5.15 p.m., special university lecture in physiology by Professor J. H. Comroe (Pennsylvania): Pulmonary Function: Tests and Interpretation.

### Wednesday, September 26

HARVEIAN SOCIETY OF LONDON.—At 11, Chandos Street, W., 8.15 p.m., Professor Hans Selye (Montreal): Recent Progress in the Study of Stress.

### Thursday, September 27

ROYAL NORTHERN HOSPITAL.—2.45 p.m., Dr. E. C. O. Jewesbury: General Practitioner and Epilepsy.
SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Horton Hospital, Epsom, 8 p.m., Freud Centenary Meeting. Address by Dr. E. G. Glover.

## BIRTHS, MARRIAGES, AND DEATHS

### BIRTHS

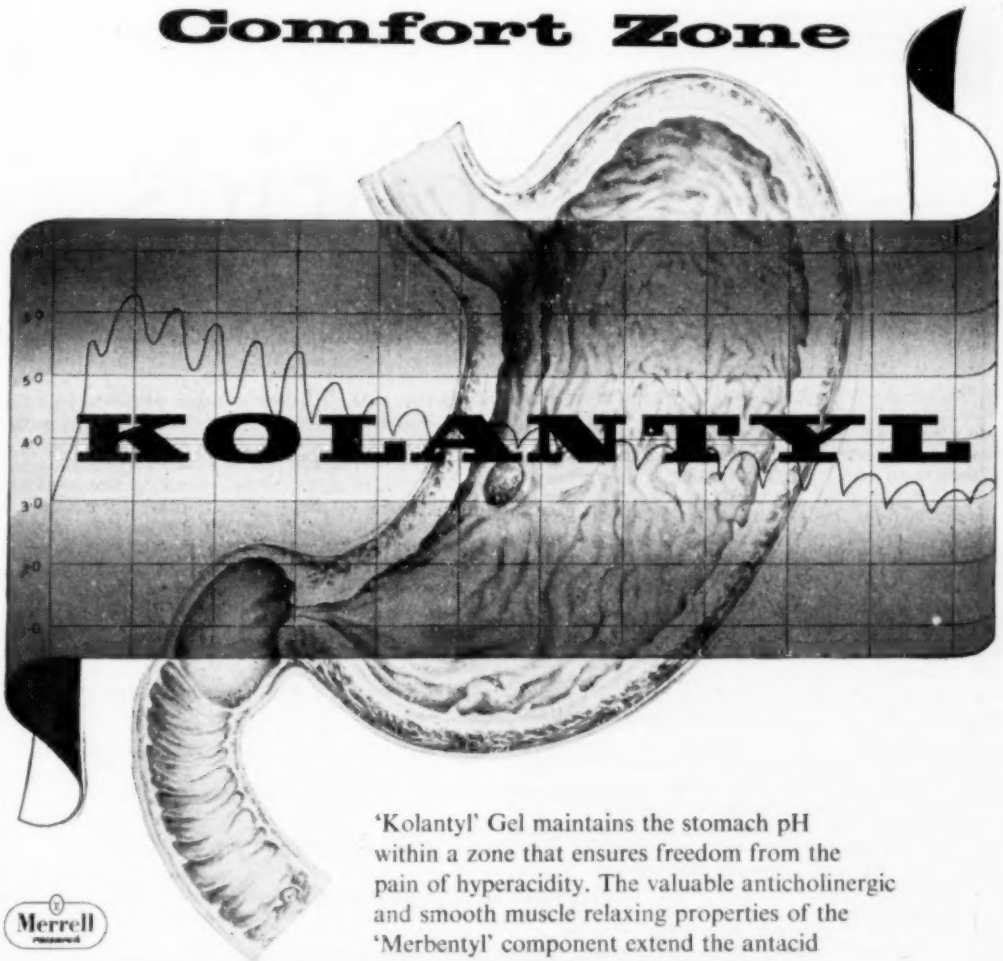
**Cantwell.**—On September 7, 1956, at the Hammersmith Hospital, London, W., to Patricia, wife of Dr. R. J. Cantwell, a daughter—Shirley Margaret.
**Cleary.**—On April 11, 1956, at the Mater Private Hospital, Sydney, Australia, to Thérèse (formerly Dunne), wife of Michael F. Cleary, M.B., B.Ch., B.A.O., a daughter—Pauline Mary Thérèse.
**Price.**—On September 7, 1956, at City Hospital, St. Albans, Herts, to Elizabeth (formerly Jones), wife of Dr. John Harding Price, a son.
**Swan.**—On September 11, 1956, at Jessop Hospital for Women, Sheffield, to Harold and Elisabeth Swan, a son.

### DEATHS

**Fitch.**—On September 2, 1956, at Ambleside, Arthur Alfred Fitch, M.R.C.S., L.R.C.P., aged 69.
**Leathes.**—On September 14, at Montreux, Switzerland, John Beresford Leathes, D.Sc., M.B., F.R.C.P., F.R.C.S., F.R.S., aged 91.
**Sinnette.**—On September 4, 1956, Malcolm Bernard Gathorne Sinnette, M.B., Ch.B., D.P.H., of Wayside, Barkerend Road, Bradford.
**Waterhouse.**—On September 1, 1956, at Oxford, Amyas Theodore Waterhouse, M.D., of Boar's Hill Hotel, Oxford, aged 83.
**Welsh.**—On September 6, 1956, at 20, Bellevue Road, Prestwick, Ayrshire, James Kennedy Welsh, M.B., Ch.B., late of 5, Mayfield Gardens, Edinburgh.

# Keeping the Peptic Ulcer Patient in the

# Comfort Zone

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British Medical Journal, 1956, *ii*, 200.

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# Any Questions?

*We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.*

### Threatened Abortion and the Foetus

**Q.**—*Have any studies been carried out on the morbidity and mortality of infants surviving threatened abortion compared with those of infants whose intrauterine life has been uneventful? Do the former group show a higher incidence of congenital malformations, mental defects, or neonatal morbidity and mortality?*

**A.**—There is a voluminous literature on this subject, but all the statistics are confused if only because different standards are taken for the diagnosis of threatened abortion. Thus, estimates of the frequency of this complication vary from 4% to 26% of all pregnancies, and figures can be selected to substantiate any thesis. A general conclusion, however, is that the chance of a deformed child is not increased in pregnancies which continue after abortion has threatened, and the treatment of threatened abortion has not raised the incidence of malformations—which again is variously estimated as occurring amongst 0.47% to 4.9% of babies born after 28 weeks, according to different classifications.

As regards other foetal risks, it might be expected that the incidence of placenta praevia, accidental antepartum haemorrhage, and premature labour would be increased in cases of threatened abortion. Here again there is no proof, and one study shows that the risk of premature labour is no higher than 2%—which is lower than the accepted overall incidence. By and large it may be concluded that when threatened abortion is a sign of foetal abnormality, and when the amount of placental separation is enough to damage the foetus, the pregnancy does not continue whatever treatment is applied. The very fact that the pregnancy survives the disturbance is a sign that all is well, and the chance of a normal healthy child resulting is said to be not less than 98.5%.

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Colin, E. D., Bartholomew, R. A., Grimes, W. H., and Fish, J. S., *ibid.*, 1950, **59**, 1208.
King, A. G., *Obstet. and Gynec.*, 1953, **1**, 104.

### Immunization in Pregnancy

**Q.**—*(1) What immunization is advised for a pregnant woman going to the Tropics (Sumatra)? (2) If she delays her journey until after her child is born, what immunization will the infant require? (3) Are there any strong reasons for advising the latter course, on the grounds that immunization might harm the foetus in utero?*

**A.**—A pregnant woman proceeding to Sumatra would legally be required to be protected against smallpox and to have a valid certificate of vaccination issued within the preceding three years. Such protection is also required for persons of all ages, so that a newly born child would require vaccination before proceeding overseas. There are no strong reasons for advising postponement of the journey on the grounds that immunization against smallpox might harm the foetus *in utero*.

Though not legally enforced, persons proceeding overseas are advised in their own interest to be protected against enteric fever. There is no evidence that inoculation of a pregnant woman with T.A.B. is likely to harm the foetus, but if it is feared that this might happen no immigration difficulties would arise from postponing the inoculation. It is inadvisable to give enteric vaccination to those aged less than one year.

Protection against yellow fever is not required for those entering Sumatra, but, if any part of tropical Africa, or other region in which yellow fever is endemic, is to be visited *en route*, yellow fever vaccination would be legally required. In that case infants and persons of all ages would have to be in possession of a valid certificate of yellow fever vaccination; again there is no available evidence that vaccination of a pregnant woman would harm the foetus *in utero*.

There is, however, always a slight risk that any illness or fever no matter how mild or transient might adversely affect pregnancy in the early months, and this risk, though minimal, would be more particularly expected in primary vaccination against smallpox. If the person concerned is unwilling to accept the risk it would be necessary to postpone the vaccinations and therefore the journey until after the first few months of pregnancy.

### Crops of Styes

**Q.**—*What treatment is advised for a child with recurrent styes who is sensitive to penicillin eye ointment? How can further attacks be prevented?*

**A.**—Children who are otherwise in excellent health may suffer from a crop of styes without any evident provocation, just as they may from time to time break out into successive boils on other parts of the body. In most cases the crop will spontaneously come to an end, and all the sooner if overtreatment of a particular stye is avoided. Hot fomentations, incisions, and plucking of eyelashes are all to be deplored; nor are antibiotics and elaborate chemotherapy needed. When once a stye has begun, it will run its course in a few days, and seldom needs any treatment except gentle cleansing away of any discharge that may issue from it. If styes keep on recurring in spite of good general health, then a course of antistaphylococcal vaccine may be tried. It is useless to pretend that this remedy always succeeds, but results have been encouraging. Stock vaccine is generally considered to be as effective as an autogenous preparation.

### Diet before Glucose Tolerance Test

**Q.**—*When a patient is found to be suffering from glycosuria, it is nearly always necessary to ask for a glucose tolerance test. It is said to be important that the patient should not restrict his diet before the test. Why should this be so?*

**A.**—It is not nearly always necessary to ask for a glucose tolerance test when a patient is found to be suffering from glycosuria. A glucose tolerance test is very rarely required for the diagnosis of diabetes.[1] It has been known for nearly a century that a reduced carbohydrate diet impairs carbohydrate tolerance in dogs. If a glucose tolerance test is performed while the patient is on a low carbohydrate diet the test will reveal impaired glucose tolerance whether diabetes is present or not. The precise mechanism of this is still a subject of research.

REFERENCE

[1] *Clinical Pathology in General Practice*, 1955. B.M.A., London.

### Salt-water Swimming-pool

**Q.**—*I prefer swimming in salt water, so I propose to add salt to a private swimming-pool to make the water as near sea-water as possible. What variety of salt and what concentration are advised? Will the salt prevent algae growing and mosquito larvae breeding?*

**A.**—The simulation of sea-water is a most difficult task: this will be appreciated when it is realized that out of some eighty-odd elements known to man over thirty have been isolated from sea-water samples. The commoner salts found in water (in grammes per litre) are: sodium chloride (27), magnesium chloride (3.8), magnesium sulphate (1.6), calcium sulphate (1.25), potassium sulphate (0.8), calcium carbonate (0.12), and magnesium bromide (0.076). The salinity of average sea-water varies from about 4 to 6%. In Britain (for example, at Preston Pans, Scotland) sea-water is evaporated

for commercial purposes. If contact were made with a commercial chemical firm, no doubt crude sea-water salt could be obtained. The salt would, of course, be lost each time the pool was drained.

Green algae occur only in fresh water. These can be dealt with by copper sulphate. Sea-water is subject to infestation by blue-black algae, which will not respond to the application of copper sulphate. The blue-black variety are very tenacious and are difficult to remove even by physical means. The growth of such algae and the breeding of mosquito larvae could best be tackled by the fitting of a suitable circulating filtering and chlorinating plant, preferably one making use of break-point chlorination. Such a plant will almost certainly be necessary if the water is to remain sweet and usable, as, apart from the problems mentioned by the questioner, other difficulties will be met, such as the presence of spores which require free chlorine for their control.

### Severe Reaction to Penicillin

**Q.**—*Following an injection of 900,000 units of procaine penicillin an Indian child of 10 months with early bronchopneumonia developed urticaria of the legs the same evening. By the next day the legs were tensely oedematous and purpuric, and urticaria was still present. The condition deteriorated, and eventually both feet developed dry gangrene and fell off at the ankle-joints. Two other infants of about the same age received the same dose of procaine penicillin from the same vial without mishap. What is the explanation of this extreme reaction? Is there any treatment that might help in such a case? Have similar cases been recorded in the literature?*

**A.**—I do not know of any such very severe reaction to procaine penicillin, but certainly similar reactions have been recorded in the literature. Harkavy[1] mentions necrotizing purpuric lesions as a sensitivity response to penicillin. Many others have recorded their belief that polyarteritis nodosa can occur as a sensitivity reaction, and Schmid[2] records gangrene which was apparently associated with neither purpura nor polyarteritis nodosa. It seems very probable that this was a sensitivity response, and it is just possible that treatment at the stage when urticaria only was seen might have averted the eventual gangrene.

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[1] Harkavy, J., *J. Allergy*, 1952, **23**, 104.
[2] Schmid, M. A., *Beitr. klin. Chir.*, 1953, **186**, 463.

### Medical Treatment of Cholecystitis

**Q.**—*What dietary and other treatment is recommended in elderly patients with cholecystitis for whom operation is contraindicated? Have there been any recent advances in the medical management of such cases?*

**A.**—An acute cholecystitis may be treated initially medically, and, indeed, there is one school that believes this to be the method of choice. The patient is put to bed, pethidine and atropine are given for pain, constant gastric suction may be necessary for repeated vomiting, and hydration is maintained, if necessary, by intravenous fluids. Antibiotics may not be of much benefit in the early stages, for acute cholecystitis so often results from chemical irritation due to bile retained when the cystic duct is obstructed by a gallstone. Bacterial invasion, however, is apt to follow, and tetracyclines should be given in full doses. If symptoms fail to subside in 2 to 3 days, if the right upper quadrant mass increases, and if the white blood count exceeds 20,000 per c.mm. gangrene and perforation are imminent. In spite of age and poor general condition operation should then be seriously considered, as the mortality from these complications is about 50%.

There have been few advances in the medical management of chronic cholecystitis, and when symptoms are sufficiently severe and cholecystography confirms the condition the gall-bladder should be removed. Medical measures include correction of obesity and a bland diet avoiding heavy, greasy meals and cooked fats. The functional state of the gall-bladder determines dietary fat intake; if it is non-functioning, a low-fat diet is advisable. If cholecystography, however, demonstrates atony, a normal-fat diet can be recommended and even reinforced by such cholagogues as olive oil, 1 fl. oz. (28 ml.) three times a day, or magnesium sulphate, 60 gr. (4 g.) each morning.

### Septic Tanks

**Q.**—*On what principles do septic tanks work? Have septic tanks been superseded in rural areas where there are no sewers?*

**A.**—The purification of sewage in a septic tank is due to the action of anaerobic bacteria which attack the sewage and break down the proteins. The process is referred to as anaerobic liquefaction and is followed by aerobic nitrification, in which the nitrogen-containing by-products of the protein breakdown are converted into harmless nitrites and nitrates. This second process is carried out by passing the septic tank effluent over a filter consisting of broken stones.

The method has not been superseded in rural areas.

### Exclusion of Sugar from Diets for Obesity

**Q.**—*Why is sugar excluded from diets for obesity? I was taught that it burned up the fat.*

**A.**—Sugar as such is usually excluded from reducing diets because of its high calorie value in relation to its volume (stomach-filling quality). Other carbohydrate foods, such as vegetables, with relatively more bulk than calorie value are allowed, the carbohydrate in them being turned to sugar by the digestive processes. This amount of sugar is enough to play its metabolic part in the burning up of the surplus fat of obese persons.

## NOTES AND COMMENTS

**Diets for Coeliac Disease and Steatorrhoea.**—Dr. L. H. LAMPITT, D.Sc. (Director and Chief Chemist, J. Lyons and Company Ltd.), writes: Our attention has been drawn to the statement in the *British Medical Journal* on diets for coeliac disease and steatorrhoea ("Any Questions?" April 21, p. 937), and in particular to the last paragraph of that statement, which reads: "Only some proprietary foods are suitable for inclusion in the diet. The following are among those known to be gluten-free: . . ." The list which follows concludes with a reference to two brands of ice-cream, from which we think the assumption may readily be that other ice-creams are not or might not be suitable for inclusion in a coeliac diet. We write to inform you that our own ice-cream is entirely free from gluten, and we therefore ask you to correct your statement by including also Lyons's ice-cream.

**Corrections.**—We regret that Dr. C. B. L. Hart's initials were wrongly printed in the list of references on p. 568 in the *Journal* of September 8.

In the Educational Number, under "Medical Service of the L.C.C." (September 1, p. 536), two erroneous figures appeared in the scales of salaries for medical officers. The maximum of the higher salary scale for divisional medical officers of the London County Council is £2,270 (not £2,370), and for principal medical officers and psychiatrist (whole-time) it is also £2,270 (not £2,570). It would also be more accurate to speak of a deputy divisional medical officer as "serving" in a division instead of "living" in it.

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SUPPLEMENT TO THE
# BRITISH MEDICAL JOURNAL
LONDON SATURDAY SEPTEMBER 22 1956

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## MEDICAL MANPOWER

### FUTURE RECRUITMENT OF THE PROFESSION

The British Medical Association submitted a memorandum of evidence to the departmental committee (the Willink Committee) appointed by the Minister of Health and the Secretary of State for Scotland to estimate on a long-term basis the number of medical practitioners likely to be engaged in all branches of the profession in the future and the consequent intake of medical students required. For this purpose the Council of the Association set up a special committee consisting of the principal officers and the chairmen of all interested committees.

At the outset an important caveat is entered. The Association feels that any decision about the future size of the profession should evolve largely from conditions of supply and demand. The size of the profession should be self-adjusting through the maintenance of a high standard of general education, or scientific training, and of personal qualities. The interest of the Minister in medical recruitment is limited to the provision of doctors for the National Health Service, which is only a part—although a large one—of the activities of the profession.

In 1910 the population of Great Britain was 40.5 million. It has increased since then by 10 million, or 25%, and, what is perhaps more important from a medical point of view, it has increased disproportionately in the older age groups. Of the present population of 49.63 million, 6.89 million are males over 65 or females over 60. In 1964 the Government Actuary estimates that of a population of 50.86 million, 7.75 million will be in that over-65 or 60 category, and in 1979, with a population of 52.23 million, the number will be 9.5 million.

#### Doctors Available

While the population has increased by about 25% since 1910, the number of medical practitioners has risen by nearly 80% (from 34,000 to 61,000), though by no means all the doctors on the *Medical Register* are fully occupied in active practice in this country. This increasing number of doctors reflects, in the Association's view, the higher standard of service provided and a greater demand for doctors' services. Calculations, which must be treated with reserve because some unknown factors enter into them, suggest that the number of doctors actively engaged in general practice is 23,100; in consultant work, 8,849; on hospital staffs, 10,057; and in the public health service, 2,490.

In general practice many older practitioners who entered the National Health Service in 1948 will be eligible for a pension in 1958, but the number who may retire immediately can only be conjectured. It may well be smaller than might be supposed because the pension will not be large and the value of the compensation for loss of goodwill of former practices which they receive on retirement will have fallen with the decline in money values. It must be expected, therefore, that many practitioners will continue to work after 65.

Whatever the result of the arithmetical calculations, the Association would be opposed to the setting of an upper limit to the number of entrants to the profession. Sufficient doctors must be available to meet a changing and expanding service and the possible shifting of balance between the different branches of practice. Advances in therapy, the possible appearance of new specialties, the emphasis in modern medicine on prevention and detection of disease in the early stages, the early recognition of deviations from mental health, the treatment and aftercare involved in the new concepts of social medicine, the rapid developments in occupational health—all these factors call for consideration, and a further important factor is that the doctor should be given time to keep abreast of modern knowledge and methods. A ceiling for medical entry is therefore undesirable or even out of the question.

#### No Substantial Unemployment

It is believed that any allegation of substantial unemployment in the medical profession is unfounded. The overcrowding which is sometimes alleged is fictitious. It is true that appointments in surgery and medicine are not easy to obtain, but there is believed to be no shortage of vacancies in anaesthetics, psychiatry, and radiology. Medical men are badly needed in the medical branches of the armed Forces and in the Oversea Civil Service.

The trend for many years until 1954 had been for the numbers of general practitioners to fall while the population rose. During the first seven years of the post-war period doctors who would have liked to enter general practice were deterred by what they considered inadequate financial reward, especially as it became clear that the Spens recommendations were not in fact being fully implemented. The Association holds the view that during the next ten years an increase in the number of general practitioners will be necessary.

It is also impossible to estimate how far future advances in medicine will affect the character and scope of hospital practice. Among other things the memorandum points out that greater provision should be made for the employment of suitably trained and experienced general practitioners in hospitals. It is emphasized that the field of specialist practice should be considered as a whole rather than the different specialties in isolation. Taking everything into considera-

tion, the following rough estimate of the total number of hospital staff in the consultant and S.H.M.O. grades likely to be required in the next ten or twenty years is given in the memorandum:

| | Whole-time Equivalent | Whole-time and Part-time |
|---|---|---|
| Present establishment (1954) | 7,124 | 9,708 |
| | Whole-time Basis | Whole-time and Part-time Equivalent |
| Estimated future requirements | 9,435 | 12,974 |

While bearing in mind the possibility of alterations in the public health service, it is felt that the total number of medical officers required is unlikely to be altered materially, unless the Government envisages a complete reorganization of the service as a whole.

Between 600 and 700 general practitioners are believed to be engaged predominantly in private practice. This number is likely to remain fairly stationary, though, should the Government accept the Association's policy of securing for private patients the right to obtain medicines in the service, the number of patients privately treated and of practitioners to attend them would doubtless increase.

The memorandum includes a brief reference to the requirements in wartime (in cold, warm, and hot war), but the surplus of doctors who would be required in nuclear warfare is beyond estimate.

### Conclusion

Summarizing its conclusions, the memorandum repeats that any calculation of the actual number of doctors required during the next ten or twenty years is subject to many unpredictable and imponderable factors. Not the least of these is the rapid change in the scope of medicine. Any figure can be only a rough estimate, and, in any event, mere numbers are not the criterion of the standing of the profession or the value of its work. It is much more important that the new entrants should be of high calibre and should feel a vocation for medicine.

## PUBLIC HEALTH MEDICAL OFFICERS IN SCOTLAND

### AMENDED SICK-PAY SCHEME

Committee C of the Medical Whitley Council has agreed on certain amendments to the sick-pay scheme applicable to public health medical officers in Scotland, and has recommended local authorities to put this agreement into effect.

The present sick-pay scheme for medical officers in Scotland is the scheme set out in paragraph 14 of the Scheme of Salaries and Conditions of Service for Administrative, Clerical, and Technical Staffs (April, 1949) adopted by the National Joint Industrial Council for Local Authority Services (Administrative, etc., Staffs) with amendments which had been agreed subsequently by the Council up to February 5, 1951. Committee C has agreed that the sick-pay scheme for public health medical officers should be amended to incorporate amendments which have been made to the sick-pay scheme for other local authority officers since February 5, 1951. The revised scheme with the new additions sidelined for reference is set out in M.D.C. circular No. 31, and supersedes the arrangements set out in paragraph II (b) of appendix B to M.D.C. circular No. 2. Medical officers of health should have a copy of M.D.C. circular No. 31.

On July 11 Dr. J. Stanley Thomas, retiring honorary medical secretary of the East Ham Local Medical Committee, was presented with a silver salver by Dr. John Sullivan, chairman of the Committee, on behalf of his medical colleagues, as a tribute "not just for services rendered, but a sincere and grateful acknowledgment of his wise and friendly help at all times and his concern for the well-being of the general medical services in the area." Dr. Thomas has recently been appointed chairman of the East Ham Executive Council. The presentation was made before general medical practitioners of East Ham, their wives and guests, in the out-patient department of the East Ham Memorial Hospital.

## WAS IT A DRUG?

Regulations 16 and 17 of the National Health Service (Service Committees and Tribunal) Regulations, 1948, provide that where a practitioner prescribes under the National Health Service preparations which are not drugs or medicines, and therefore outside the scope of the Act, the executive council may recover their cost from him. If he challenges their action, the matter may be referred to the local medical committee, with the possibility of appeal to referees.

The findings of the referees in a recent appeal under the Regulations are reported below. The decision in this, as in all cases, is related to the circumstances of this particular case only and is not binding on the referees who may hear other cases.

### "Formulac"

Dr. X prescribed formulac for two patients, both suffering from hiatus hernia and one of them being pregnant at the time. The executive council decided that formulac was not a drug which they were bound to provide in these two cases. Dr. X appealed to the local medical committee, who upheld the decision of the executive council. He then appealed to the referees.

#### Appeal Hearing

At the hearing before the referees Dr. X said that there was no drug which will cure hiatus hernia, but the symptoms could be relieved by an antacid, demulcent, bulk-occupying substance taken in a recumbent position. Formulac was a combination of milk powder and methyl cellulose, aluminium hydroxide, magnesium trisilicate, and ascorbic acid. He relied on the collective action of these ingredients to attain his purpose. The nutritive value of the milk powder was insignificant, being equivalent to 25 calories in one dose, against 200 calories in a glass of milk; the dose was one tablespoonful once a day. The powder, as he used it, was the vehicle only for administering the drugs with which it was combined.

The local medical committee gave the referees the reasons for its decision. It considered that, though other substances were added to the milk powder, formulac was basically a food and used as a substitute for other foods. If it were allowed to be prescribed for its vitamin content a loaf of vitaminized bread should also be allowed. The local medical committee conceded that the addition of magnesium trisilicate and aluminium hydroxide might counteract any uncomfortable symptoms caused by the food content of the powder, but the same effect could be obtained with a partially digested food.

#### Referees' Findings

The referees were of the opinion that it was no part of Dr. X's purpose to provide his patients with nourishment, or even extra nourishment. Milk powder was not a concentrated food, and one tablespoonful a day could have no appreciable effect on the patient's diet. The local medical committee seemed to have thought that the magnesium trisilicate and aluminium hydroxide were intended to counteract any uncomfortable symptoms caused by the food contained in the powder. The referees, however, were satisfied that the intention was to counteract the symptoms caused by the disease and the presence of food taken by the patient in the ordinary way to sustain life. The methyl cellulose, the magnesium trisilicate, and the aluminium hydroxide could have been prescribed as a separate mixture directed to be taken with a glass of milk or a tablespoonful of milk powder, but the referees thought that the importance of the milk powder in relation to the admittedly pharmaceutical elements in the preparation was so small that the nutritional value of the powder could be ignored, and the purpose of the prescription as a whole could fairly be regarded as medicinal. If it were held that the preparation was a compound of food and medicine the proviso to Regulation 17 (2) of the National Health Service (Service Committees and Tribunal) Regulations would require that

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1.0 G. cachets in containers of 100 and 500.
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(1) *J. Pharmacy & Pharmacol.*, 1953, **5**, 849.

(2) *Schweiz. Med. Wschr.*, 1955, **85**, 222.

(3) *Brit. Med. J.*, 1953, **1**, 95.

(4) *Brit. Med. J.*, 1953, **1**, 901.

(5) *Lancet*, 1955, **1**, 116.

(6) *Tubercle, July* 1955, **36**, 209.

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the value of the food and the value of the drugs should be separately ascertained. The referees doubted whether this would produce any significant result. They decided that in all the circumstances formulae, as used in this case, was a drug which the executive council was bound to provide.

## Questions Answered

### National Insurance for Part-time Employees

**Q.**—*What is my National Insurance liability as an employer of part-time domestic help for which I pay 16s. a week?*

**A.**—A person employed on domestic work for less than eight hours a week by any one employer is not insurable as an "employed" person, though that person is insurable under the Industrial Injuries Act. In this case the employer would not be liable to pay any contributions towards the National Insurance scheme—neither the employee's share nor the employer's share. The employer should, however, stamp a card weekly with 7d. stamps to cover contributions to the Industrial Injuries scheme. Threepence of this should be deducted from the 16s. paid. If, however, the domestic work occupies more than eight hours a week the worker is insurable as an employed person and stamps to the full value (employer's and employee's share) should be placed on her card weekly. The employee's share can be deducted from the 16s. paid, but if this is not done it is the employer's responsibility to make up the full amount. The Regulations make it quite clear that once the weekly wage has been paid it is legally impossible for an employer to obtain from the employee any contribution which should have been deducted but was not.

### Fees for Hospital Patients' Certificates

**Q.**—*As a full-time senior house officer am I entitled to charge a fee for "works notes" certifying that persons are in- or out-patients of the hospital and thereby unable to attend work?*

**A.**—A report to a patient who is under observation or treatment at the hospital comes within the scope of a doctor's duties under the terms and conditions of service of hospital medical staff in the N.H.S. when the information required can be given without a special examination of the patient by reference to hospital records or from knowledge acquired in the course of attendance on the patient. In these circumstances a fee cannot be charged for the report. This arrangement also covers the furnishing of a report on the patient, with his consent, to an interested third party, for instance an employer. When the patient is no longer under observation or treatment at the hospital when the report is asked for, or if a special examination is required, the work is outside the practitioner's contract and a fee may be charged.

During 1955 about 86,000 pensioners of the 1939-45 war were examined by medical boards and about 68% had their current assessments continued unaltered. The total number of examinations by medical boards was over 108,000. These figures are given in the *Report on War Pensioners for 1955* (House of Commons Paper No. 331 of session 1955-6, H.M.S.O., price 4s. 6d.) issued jointly by the Ministry of Pensions and National Insurance, the Ministry of Health, and the Secretary of State for Scotland. In England, Wales, and the Irish Republic nearly 11,000 in-patients were discharged after treatment in hospital in 1955, and out-patient attendances totalled about 8,000. At the end of 1955 1,516 war pensioners were being treated as hospital in-patients and 6,422 as out-patients. In Scotland 1,248 were treated in hospital in 1955. In Northern Ireland the number was about 920.

## HOSPITALITY

A French doctor's niece, a widow, would like to stay in a doctor's house in London on an *au pair* basis for a year in order to improve her knowledge of English.

Two French girls would like to visit families living in the London area. They are willing to care for children.

A German doctor's daughter and a girl friend would like to arrange exchange with a British doctor's daughters for six months or a year and would be willing to help in the house. They wish to study English and prefer somewhere near a language school.

A Yugoslav doctor's daughter, aged 17, would like to arrange a holiday exchange in 1957. The Yugoslav family live in a comfortable house with a garden, in a small town. The British girl would have a room of her own during her stay. She would be taken to the sea by the parents, who also speak English. Photographs are available.

A doctor from Hamburg would like a holiday exchange for his daughter, aged 11, for her summer holiday in 1957.

Would anyone interested please get into touch with Brigadier H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

## Correspondence

*Because of heavy pressure on our space, correspondents are asked to keep their letters short.*

### Keeping Up With the Times

SIR,—Every member of our profession who sits back for a moment to contemplate where the present N.H.S. is taking us will heartily applaud your leading article entitled "Keeping Up With the Times" (*Journal*, August 18, p. 406).

Your correspondence columns show how deeply the profession has been stirred by the refusal of the Minister even to consider a claim for increased remuneration. We have every right to insist that the Government of to-day keeps the pledges of its predecessors. Against its better judgment (as expressed by the plebiscites of 1948) the profession agreed to accept service in the N.H.S., with remuneration on the basis of the two Spens reports: We have kept our part of the bargain and it is up to the Government to do the same.

We shall, however, be making a great mistake if we allow the daily press to give the impression that we are simply out for more pay: every time such headlines appear our professional status declines a stage further in the eyes of the public. Let us make it known as widely as possible that the anxieties so widespread in the profession are not due simply to problems of remuneration. They are basically due to our realization that, under the N.H.S. as at present constituted, we are progressively losing our freedom and our status as a learned profession, while being forced to accept the dictates of the politicians. Would the Minister have dared to speak to the profession in 1948 as he has done in 1956? The Guillebaud Committee, set up by the Minister, makes it clear what is in store for us when it states[1]: "Longer experience of the working of the Service and the gradual emergence of a new generation may make comparatively simple many things which now appear difficult or impracticable."

We have had over eight years' experience of working in the N.H.S. We have seen how we are made a political pawn as (in your words) "rival political parties feverishly search for methods of bribing the voter, and do not hesitate to use Medicine in this unholy game." We must look afresh at those methods which gave us independence of action in the past: you mentioned the surrender of the right to buy and sell goodwill—for a sum which has proved quite unrealistic. Unfortunately we allowed the N.H.S. to include

100% instead of 90% of the population—an alternative which would have allowed sufficient independent practice for us to be able to withstand this domination of our profession—and, if a sacrifice is needed to secure the future, we must be prepared to face this.

The leaders of our profession must get busy and tell us how to escape from the net which is closing ever more closely around us. Your leading article is a clarion call for us all to wake up and to act quickly now—to-morrow will be too late.—I am, etc.,

London, N.W.1. E. C. WARNER.

REFERENCE

[1] *Report of the Committee of Inquiry into the Cost of the National Health Service*. 1956, p. 62. H.M.S.O., London.

### Keeping Records in General Practice

SIR,—Not very long ago in your columns you printed certain communications on records in general practice. I wonder whether you would be interested in a method which, while not only ensuring good record-keeping of patients who are visited, also saves the G.P. and his secretary a great deal of time. Two of us have worked this system for eight months and have found it very satisfactory.

Most G.P.s keep a visiting book which entails re-writing visiting lists at intervals and arranging the order of visiting by various annotations in the visiting book. If record cards are entered up, this entails additional work in getting the cards out of the files before visiting and returning them to the files afterwards. What we have done is to use the patients' record cards as a visiting list, thus dispensing with a visiting book.

In the surgery we keep a filing box of the Post Office sorting pigeon-hole type, with a compartment for each day of the week. If a patient is seen on a Monday and requires another visit on the Wednesday his record card is put into the Wednesday compartment after the Monday visit.

The next problem to be met is if the patient needs a visit next week or in two or four weeks' time. To overcome this we number the weeks. If this week is week 1, then next week is week 2, the following week is week 3, and the next week is week 4. One month from week 1 is again week 1; one month from week 2 is again week 2; and so on. A calendar is kept in the surgery with all the weeks in the year so numbered. Thus, if a patient is seen in week 1 on a Monday and requires a visit on a Wednesday in a fortnight's time—i.e., week 3—then a figure 3 is entered on the top right-hand corner of the patient's record card and the card is filed in the Wednesday compartment in the surgery filing box. A chronic patient who is visited every fortnight throughout the year will have (for example) the figures 1, 3 or 2, 4 entered on his record card. In the doctor's car is kept another box with compartments for each day of the week, working on the same principle. This box, of course, is quite small—about the size of a small basket.

The surgery box is capable of various refinements. Each doctor working in a partnership can have one column in the box so that each doctor's visits are kept separate. Alternatively, if zoning by geographical areas is employed, then the box can be constructed with as many columns as there are zones. Before starting the day's visits, all that is required is to arrange the record cards in order of sequence of visiting. The secretary does not have to get all the cards out of the main files, as the majority will already be in the surgery box. All that she has to do is to get the cards of *new* visits for that day.

With this system (which we have christened "the Kirone system") whenever a patient is visited all his records of past illnesses and present illness are *always* at hand. Visiting books (with all their attendant writing up) need not be kept at all. If a patient is seen by one doctor one day and another doctor the following day, it is an easy matter to transfer the record card from the one doctor to the other. The system itself costs nothing to run and is very simple to use. It has frequently withstood the strain of 25–30 visits per day per doctor, the area of visiting covering about 100 square miles. We also employ a similar system for surgery attendances which we have found very satisfactory. —We are, etc.,

J. M. KIRKWOOD.
RICHARD D. JONES.

Cheadle, Staffs.

### Remuneration Claim

SIR,—Would it not be useful, in discussing the remuneration issue, to publish a few earnings in other occupations? One may quote these: cleaner in a motor factory, £16 a week; labourer on hydro-electric scheme in Scotland, £18 a week; girl of 22 making costumes, £12 to £14 a week.

Not only is it useful to give such figures for purposes of comparison but also to illustrate how our own expenses, from the high payments quoted, have risen. And another illustration might be interesting. If we consider a working family of six persons, the parents and two children employed, their combined visible income may easily lie in the range of £1,000 to £1,500 yearly. Though they do not usually, in presenting wage demands, quote or remember the fact, such a family is often receiving a large "hidden" income in the form of subsidies on education, housing, and so on. This corresponds to a much larger gross income, which may lie in the range of £250 to £500.

It is thus evident that without the years of training, of large expenditure, and intellectual work of a professional man, the family reward is often as good as his. And with this there is no need for such professional and social expenses.—I am, etc.,

Hitchin, Herts. G. C. PETHER.

SIR,—May an interested outsider have the courtesy of your columns to make an observation on the current wage dispute? I am at a loss to understand why so many writers to the *B.M.J.* insist on making excuses as to why they want more money. Surely the medical profession should be the highest-paid group in any country. Is there a more important group? Does anyone have a more exacting job, or more responsibility than a doctor? Does a politician? a civil servant (so often uncivil)? an innkeeper? a coalminer?

To be effective a doctor has to be respected. People do not respect nor do they seek the advice of a man who is financially embarrassed. This may be an unpleasant thought, but it is nevertheless true, regardless of socialist ideology.

This is indeed the age of the trade union, and the British medical profession certainly seems to need one. The B.M.A., which led a blind and bewildered profession into the National Health Service, is obviously doing very little. A new organization is needed. One which will *demand* and not go "cap in hand" to ask on the basis of this report or that report. If the demands are not met, and promptly, then mass resignation from the Service is indicated. Why there has not already been mass quitting of the Health Service I find it difficult to understand. I feel, however, that the first step to improve the lot of the British doctor should be the formation of an organization or union with power to ensure collective action. The time for circumlocution, quibbling about ethics, and "holier-than-thou" attitudes is past. A "get tough" policy is needed.

This fight is one which doctors everywhere may one day have to face. I hope the leadership which the world has come to expect from British medicine will be shown in this struggle.—I am, etc.,

Alberta, Canada. A. P. N. LEE.

### Charging Each Other

SIR,—Although I should imagine that no one could have received more generous kindness from colleagues than my family and I have done, I doubt if "despicable" is quite the word to be used if an account is rendered.

Circumstances differ so widely. I have had at least one present which must have cost much more than if I had sent in a bill. The late Dr. Whitfield told me that his house

was full of fountain-pens. His neighbour said to me: "If you must give me a present do let it be a cheque." One may hesitate to go to the best man in a specialty simply from reluctance to accept his charity. Some of us have joined a provident society chiefly in order that the specialist may receive some recognition in addition to our gratitude; must we be disappointed and our intention frustrated?

As between general practitioners, I think that the position is usually different. Here most of us, all of us I expect, feel that the greatest compliment one can receive is to be called in by one's neighbour, and the question of finance therefore can arise only in very exceptional cases.—I am, etc.,

Beckenham, Kent. W. MAXWELL PENNY.

### New Partnership Surgery Premises

SIR,—I was interested in Dr. E. Anthony's description of the above (*Supplement*, September 8, p. 121), and I will be grateful if you can spare space enough to air a sense of injustice with the Ministry of Health over the financial aspect of such desirable premises.

My partner and I opened a very similar "surgery" in July, 1955, though somewhat smaller and costing us, without furniture and equipment, something over £3,000. The Ministry refused our appeal for financial aid by reason of our not being a large enough "group" practice (we were a "group" of three). Being in a rural district we are most unlikely ever to become a large group. It appears that the latter are, or may be, advanced a large proportion of the cost of such premises free of interest by the Ministry. Surely such discrimination is grossly unfair, additionally so in that the cost to the individual diminishes proportionately with the numbers of his partnership.—I am, etc.,

Sunninghill, Berks. C. MATTHEWS DUNCAN.

### Board and Lodging Charges

SIR,—Recently the Government urged the freezing of prices to halt the upward trend of the cost of living. Following upon this, on July 9, the Minister of Health refused to discuss an adjustment in pay for medical staff whose remuneration has fallen below the standard promised at the inception of the National Health Service. A fortnight later insult was added to injury when we received a memorandum with details of increased charges for residential emoluments. The statutory one month's notice was not given nor any guarantee of minimum standards of accommodation.

The new charges involved a loss of £40 per annum to the registrars in this hospital at a time when all prices are rising. It is in the interests of the patients and hospital that registrars are resident. Other occupations requiring people to reside away from their homes subsidize them for so doing. Don't let us be penalized for being instantly available by day and by night.—We are, etc.,

B. G. HAGGART. A. LL. OWENS.
T. H. MARMION. S. E. PREBBLE.
J. B. MONTGOMERY.

Prescot, Lancs.

### Waiting-room Rhyme

SIR,—From time to time there comes to my mind the rhyme quoted below, but my memory fails me concerning its source. Albeit of equivocal literary merit, it seems to me the most apposite and quaint of waiting-room furnishings, and I am curious to know the name of the author, as I feel that a measure of credit is due to him. Perhaps one of your readers is able to enlighten me. The verse, as I recall it, is as follows:

"While in this room you wait,
Read, knit, do crosswords or just meditate.
Good work takes time, to shirk is sin;
Have patience, sitter, and exchange a grin."

—I am, etc.,

Bristol, 2. DENNIS J. STAYTE.

### R.A.M.C. Golfing Society

SIR,—At the annual general meeting of the Royal Army Medical Corps Golfing Society in June alterations were made in the rules so that all commissioned officers of the Corps, serving or retired, including those who held emergency commissions, would be eligible for full or associate membership of the Golfing Society.

Meetings are held in spring, summer, and autumn, and matches are played throughout the year. The accent is on the opportunity to renew old friendships more than on the quality of the individual golfer. The autumn meeting will be held on Thursday, October 4, at Woking Golf Club. All officers of the Royal Army Medical Corps, serving or retired, interested in joining the Golfing Society should write to the honorary secretary, Major-General E. Marsh, *M.C.*, 14, Orchard Rise, Kingston Hill, Surrey, or to the captain, Brigadier R. Phillipson, O.B.E., the War Office, A.M.D.7, Lansdowne House, Berkeley Square, London, W.1. —I am, etc.,

London, W.1. R. PHILLIPSON.

## H.M. Forces Appointments

### ROYAL NAVY

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commander V. S. Hughes-Davies, V.R.D., has retired.

Surgeon Lieutenant K. S. Stewart to be Surgeon Lieutenant-Commander.

Acting Surgeon Lieutenant J. C. Campbell to be Surgeon Lieutenant-Commander.

### ARMY

Colonel C. H. K. Smith, O.B.E., M.C., late R.A.M.C., has retired on retired pay, and has been granted the honorary rank of Brigadier.

ROYAL ARMY MEDICAL CORPS

Captain B. A. Gavourin to be Major.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Captain B. R. Frisby, from R.A.R.O., Class III, to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Major E. M. Wright, T.D., has retired, retaining the rank of Major.

Captains Sir James D. Fraser, Bt., and J. R. Murdock have been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Brigadier A. L. Crockford, C.B.E., D.S.O., M.C., T.D., Q.H.S., from Active List, to be Brigadier.

Colonels W. E. Tucker, C.V.O., M.B.E., T.D., C. W. Arnot, O.B.E., M.C., T.D., G. B. Mitchell-Heggs, O.B.E., T.D., F. R. Langmaid, O.B.E., T.D., Q.H.P., and R. Mowbray, from Active List, to be Colonels.

Lieutenant-Colonels G. E. David, M.C., T.D., T. P. Sewell, T.D., and F. J. G. Slater, M.C., T.D., from Active List, to be Lieutenant-Colonels.

Majors (Honorary Lieutenant-Colonels) C. E. W. Bower, T.D., J. A. W. Segerdal, T.D., and F. H. Hollingshead, O.B.E., T.D., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Major J. R. Hamerton, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the rank of Major.

Majors G. R. Fryers, F. W. Newby-Good, T.D., and J. A. Paterson, from Active List, to be Majors.

Captain (Honorary Major) A. M. W. Thomson has ceased to belong to the T.A.R.O., retaining the honorary rank of Major.

Captains (Honorary Majors) N. J. Crawford, W. N. Chisholm, M.B.E., T.D., and A. G. McCallum, having attained the age

limit of liability to recall, have ceased to belong to the T.A.R.O., retaining the honorary rank of Major.

Captain (Acting Major) R. Cutts, from Active List, to be Captain, and has been granted the honorary rank of Major.

ROYAL AIR FORCE

Group Captain G. A. M. Knight, C.B.E., to be Air Commodore.

Wing Commander G. Gilchrist to be Group Captain.

Wing Commander J. H. Neal has retired.

Squadron Leaders E. C. B. Bramwell, C. R. Griffin, and S. E. Cupples to be Wing Commanders.

Flight Lieutenants R. S. Wambeek, D.F.C., I. R. Lindsay, E. L. Gilbert, D. W. Atkinson, Agnes R. D. Bartels (Woman Medical Officer), F. J. Davies, M. A. de Chenu, G. K. K. McKay, A. D. Moore, and A. J. Merrifield to be Squadron Leaders.

Flight Lieutenants D. D. Forbes, A. D. Mason, R. A. Davidson, M. H. Gough, E. J. McCabe, and A. J. Rowland have been transferred to the Reserve, retaining the rank of Squadron Leader.

P. D. L. Roper to be Squadron Leader.

ROYAL AIR FORCE RESERVE OF OFFICERS

Squadron Leaders J. D. Milne and C. N. Young have relinquished their commissions, retaining the rank of Wing Commander.

Squadron Leader J. L. Brown has relinquished his commission, retaining his rank.

ROYAL AUXILIARY AIR FORCE

Flight Lieutenant M. Y. Paget to be Squadron Leader.

ROYAL AIR FORCE VOLUNTEER RESERVE

Squadron Leaders K. G. Bergin and J. Jamieson have relinquished their commissions, retaining the rank of Wing Commander.

Squadron Leader B. H. Pickard has relinquished his commission, retaining his rank, on appointment to the R.A.F.V.R.

Squadron Leaders A. J. Beddie, T. S. B. Kelly, D. A. Davies, G. D. Elphick, R. G. D. Forward, K. V. Jackson, L. S. Calvert, J. Evans, P. T. D. Lynch, J. C. McGregor, H. G. Magill, and A. J. McKendrick have relinquished their commissions, retaining their rank.

Flight Lieutenant W. E. Gibb has relinquished his commission, retaining the rank of Wing Commander.

Flight Lieutenants G. H. B. Roberts, A. L. Alban, N. J. Burnand, J. E. Cawthorne, W. J. Lynd, J. McA. McArthur, J. L. Morgan, A. M. Howard, J. P. Kelly, and C. W. R. Rayne-Davis have relinquished their commissions, retaining the rank of Squadron Leader.

## HER MAJESTY'S OVERSEA CIVIL SERVICE

The following appointments have been announced: G. C. Butler, M.B., B.Ch., D.P.H., Senior Medical Officer (Administrative), Northern Region, Nigeria; A. J. Evans, M.B., B.S., D.A., Specialist (Dermatologist and Venereal Diseases), Western Region, Nigeria; C. R. Jones, M.B.E., M.B., B.Ch., Assistant Health Adviser, Eastern Aden Protectorate; J. D. Llewellyn-Jones, M.B., B.Ch., M.R.C.O.G., Specialist Obstetrician, Federation of Malaya; W. Puleston-Jones, M.R.C.S., L.R.C.P., D.P.H., D.T.M.&H., Administrative Medical Officer, Grade A Supernumerary, Federation of Malaya; A. K. Kouppas, M.D., D.M.R.D., Specialist (Radiologist), Cyprus; J. J. MacPherson, F.R.C.S.Ed., Specialist Surgeon, Grade B, Federation of Malaya; R. J. K. Tallack, M.B., Ch.B., D.P.H., Senior Medical Officer, Kenya; T. Wilson, M.D., D.P.H., D.T.M.&H., Director, Institute for Medical Research, Federation of Malaya; C. M. Bahemia, L.R.C.P.&S.Ed., Medical Officer, Health Department, Mauritius; F. P. Brown, M.B., B.S., D.R.C.O.G., Medical Officer, Kenya; R. H. Currie, M.B., Ch.B., D.P.H., Medical Officer, Special Grade, Tanganyika; W. P. Hadlow, M.B., B.S., Medical Officer, Somaliland Protectorate; J. A. Kay, B.M., B.Ch., Medical Officer, S.P.H.S., Fiji; Ann H. Low, M.B., B.S., D.C.H., Lady Medical Officer, Uganda; H. J. Marrable, M.B., Ch.B., Medical Officer, S.P.H.S., Fiji; N. O'Beirn, M.B., B.Ch., Medical Officer (Tuberculosis), Western Region, Nigeria; R. O. Parnis, M.D., F.R.C.S., Specialist Surgeon, Western Region, Nigeria; K. D. Ray, M.B., F.R.C.S., Medical Officer, Special Grade, Northern Region, Nigeria.

### Dangerous Drugs Act: Restoration of Authority

The Home Office announces that the authorities granted by the Dangerous Drugs Regulations under the Dangerous Drugs Act, 1951, have been restored to Dr. Richard Morton Geldart (Dorset).

# Association Notices

## GENERAL MEDICAL SERVICES COMMITTEE

### Assistants and Young Practitioners Subcommittee

The following have been returned as representatives of unestablished principals and assistants on the Assistants and Young Practitioners Subcommittee for 1956–7:

| *Region* | *Unestablished Principal* | *Assistant* |
|---|---|---|
| 1 | No nomination | No nomination |
| 2 | R. M. S. Matthews (Romford) | No nomination |
| 3 | I. M. Quest (St. Helens, Lancs) | R. D. Jones (Staffs) |
| 4 | R. A. A. R. Lawrence (Leabrooks) | No nomination |
| 5 | F. G. Tomlins (Chingford, E.4) | No nomination |

### Diary of Central Meetings

SEPTEMBER

| | | |
|---|---|---|
| 24 | Mon. | Armed Forces Committee, 2 p.m. |
| 25 | Tues. | Organization Committee, 12 noon. |
| 26 | Wed. | Staffing Committee, 11 a.m. (*Time changed from 2 p.m.*) |
| 26 | Wed. | Tuberculosis and Diseases of the Chest Group Committee, 2 p.m. |
| 27 | Thurs. | Constitution Committee, 10.30 a.m. |

OCTOBER

| | | |
|---|---|---|
| 3 | Wed. | Public Relations Committee, 2 p.m. |
| 3 | Wed. | Distribution Subcommittee, Medical War Relief Fund, 2.30 p.m. |
| 4 | Thurs. | Central Consultants and Specialists Executive, 10 a.m |
| 5 | Fri. | Public Health Committee, 10.30 a.m. |
| 10 | Wed. | Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m. |
| 11 | Thurs. | Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |
| 17 | Wed. | Defence Trust Subcommittee, G.M.S. Defence Trust, 2.30 p.m. |
| 18 | Thurs. | G.M.S. Committee, 10.30 a.m. |

### Branch and Division Meetings to be Held

BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, September 28, 8.15 p.m., meeting. Address by Dr. T. J. B. Geffen: "Aetiology of Hypertension."

ESSEX BRANCH.—At Palace Hotel, Southend-on-Sea, Saturday, September 29, 12.30 for 1 p.m., official luncheon; members' wives and friends invited; 2.30 p.m., annual general meeting. Address, followed by questions and answers, by Dr. Donald Hunter: "Diagnosis."

LONDONDERRY DIVISION.—At Londonderry City and County Hospital, Friday, September 28, 8.15 p.m., annual general meeting.

MID-HERTS DIVISION.—At Wellington Court Clinic, Bricket Road, St. Albans, Friday, September 28, 8.45 p.m., meeting.

READING DIVISION.—At Royal Berkshire Hospital, Wednesday, September 26, 8.30 p.m., meeting. Lecture by Dr. S. F. Logan Dahne: "B.M.A. Conference at Toronto, 1955, and Visit to Eastern States of U.S.A."

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, September 28, 9 p.m., Medical Brains Trust. Panel: Drs. R. C. S. Benson, W. J. S. Ewan, A. S. Mason, and F. McL. McGown.

SOUTH WARWICKSHIRE AND RUGBY DIVISIONS.—At Clarendon Hotel, The Parade, Leamington Spa, Tuesday, September 25, 8 for 8.15 p.m., informal supper; 9 p.m., joint meeting.

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, September 28, 3 p.m., clinical meeting.

### Meetings of Branches and Divisions

HAMPSTEAD DIVISION

The following officers were elected at the annual general meeting held on May 23, 1956:

*Chairman.*—Dr. Lionel J. Stoll.
*Vice-chairman.*—Dr. Arthur Dalby.
*Honorary Secretary and Treasurer.*—Dr. E. Donald Page.
*Assistant Honorary Secretary.*—Dr. John Etheridge.

# Vitamins in psychiatry

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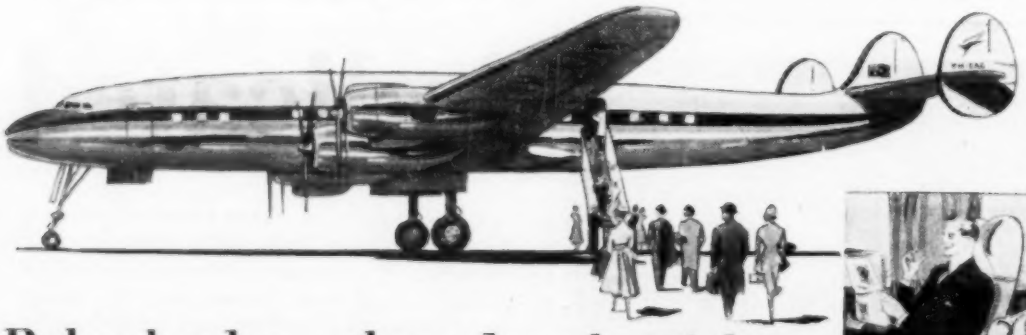

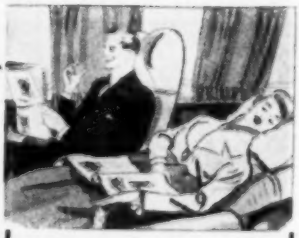

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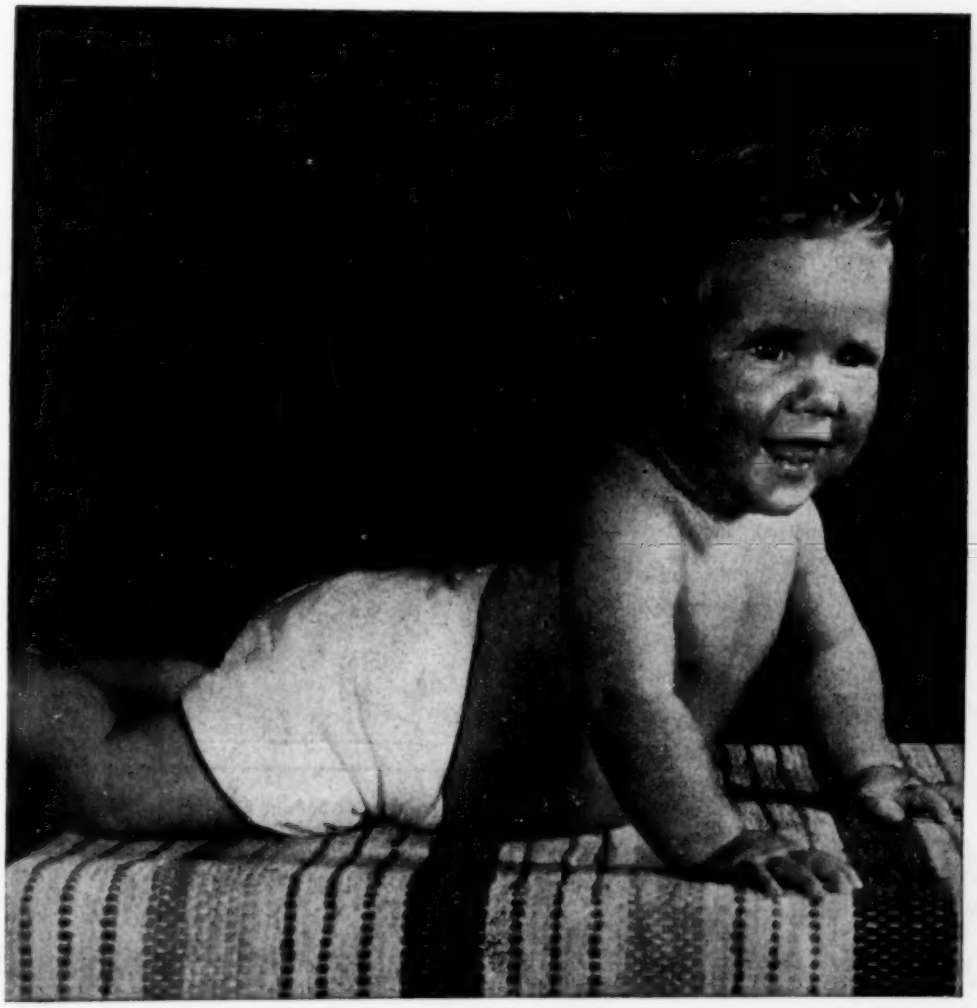

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A fully registered medical practitioner who is liable for National Service must obtain defermen of recruitment in writing from the Central Medical Recruitment Committee or (in Scotland) the Scottish Central Medical Recruitment Committee before accepting any civilian appointment.

The position of provisionally registered medical practitioners who are liable for National Service has been made clear in a notice sent to them by the Ministry of Labour and National Service.

## SALARY SCALES OF JUNIOR GRADES OF HOSPITAL MEDICAL STAFF

**Registrar Grades, Whole-time**

(a) *REGISTRAR*: Posts obtained normally not less than two years after registration as a medical practitioner and held normally for two years: £850 per annum in the first year; £965 per annum in the second and any subsequent years.

(b) *SENIOR REGISTRAR*: Posts obtained normally not less than four years after registration as a medical practitioner and held normally for four years; £1,100 per annum in the first year; £1,200 per annum in the second year; £1,300 per annum in the third year; £1,400 per annum in any subsequent years.

**Other Grades, Whole-time**

(a) *HOUSE OFFICERS*:

(i) *Provisionally registered medical practitioners*: £425 per annum for the first post held; £475 per annum for the second and all subsequent posts held;

provided that the employing authority (subject in the case of a Hospital Management Committee to the consent of the Regional Hospital Board) shall have discretion to determine that the remuneration of any officer holding his first post in the National Health Service as a House Officer shall be £475 per annum if they are satisfied that the officer has held at least one hospital post outside, of not less than six months' duration, involving clinical responsibilities equivalent to those of house posts in the National Health Service and supervised by appropriate specialist staff.

(ii) *Fully registered medical practitioners*: £525 per annum for any post held;

provided that in exceptional circumstances, subject to the consent of the Minister, this rate may be exceeded by up to £50 per annum where a post cannot be filled otherwise.

In each case under sub-sections (i) and (ii) above, a deduction of £125 per annum in respect of board and lodging and other services provided shall be made and each post shall be tenable for six months.

(b) *SENIOR HOUSE OFFICER*: Posts obtained normally not less than one year (in Scotland, two years) after registration as a medical practitioner and normally held for one year only: £745 per annum.

(c) *JUNIOR HOSPITAL MEDICAL OFFICER*: Officers who have held house appointments but who are not Registrars and who have less responsibility than other hospital officers of non-consultant status: £775 (for an officer appointed not less than one year after full registration as a medical practitioner) by £50 to £1,075 per annum.

## ALL NATIONAL HEALTH SERVICE HOSPITAL APPOINTMENTS ARE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF SERVICE OF HOSPITAL MEDICAL STAFF

Those intending to apply for resident appointments in the Registrar grades are recommended to make inquiries with regard to the deductions proposed for board and lodging at the time of submitting their applications, where this is not stated in the advertisement.

(25/1/55)

# CLASSIFICATION

**and order of appearance**

**Practices**
**Partnerships**
**Assistantships**
**Trainee General Practitioners**
**Locums**
**Situations (Medical)**

**APPOINTMENTS**

**including pre-registration under appropriate specialty headings, as follow:**

**Anaesthetics**
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**Chest and Tb.**
**E.N.T.**
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**Infectious Diseases**
**Medicine**
**Neurology**
**Neurosurgery**
**Obstetrics and Gynaecology**
**Ophthalmology**
**Orthopaedics**
**Paediatrics**
**Pathology**
**Physical Medicine**
**Plastic Surgery**
**Psychiatry**
**Radiology**
**Radiotherapy**
**Rheumatology**
**Surgery**
**Thoracic Surgery**
**Urology**
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**For vacancies (except those in Scotland) apply on Form E.C.16A, obtainable from the Executive Council. Mark envelope "Vacancy."**

**WANDSWORTH (Balham)**

Deceased practitioner (male). List at present approximately 1,590. Premises may be available for purchase. "Intermediate" area. Form of application (E.C.16A) available from Clerk, London Executive Council, Insurance Street, W.C.1. Completed forms to be received by the Council not later than 12 noon on Monday, October 1, 1956. (8392)

**NATIONAL HEALTH SERVICE**
**EXECUTIVE COUNCIL FOR THE COUNTIES OF BANFF, MORAY, AND NAIRN**
**General Medical Service**
**Vacancy—Tomintoul**

Applications are invited from registered medical practitioners to fill a vacancy which will arise in the Medical List at December 1, 1956. The successful applicant will succeed to the practice at present carried on at Tomintoul, Banffshire. The area to be served is the village of Tomintoul and the surrounding rural district. The number of persons on the list at July 1, 1956, was 606 and there is an Inducement Payment, the annual rate at present being £800. The doctor appointed will be required to undertake dispensing for all the patients on the list. A house owned by the Council is available at a moderate rent. Further details about the practice may be obtained from the subscriber. Applications, in writing, stating age, qualifications and professional experience, together with any other supporting particulars, including copies of not more than three testimonials and the names of three referees, should be lodged with the undersigned not later than October 13, 1956.—W. S. Leitch, Clerk to the Council, Hamilton Drive, Elgin. (8391)

## PRACTICES (Offered)

**ATTRACTIVE DUBLIN SUBURBAN RESIDENTial practice, low outgoings, price £3,300, mortgage if desired.—Box PR.1877, B.M.J.**

## PRACTICES (Wanted)

**PARTNERSHIP REQUIRED (VIEW TO EVENtual succession preferable), London or environs, within 20 miles. Experienced. Interested in house purchase.—Box PR.1878, B.M.J.**

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**EXPERIENCED PRACTITIONER, CAPITAL** available for house purchase, car owner, is seeking a Partnership in Metropolitan area, preferably Central.—Box PA.1853, B.M.J.

## ASSISTANTSHIPS VACANT

**Wanted, Assistant, married, car owner. Expanding** Midlands colliery practice, surgery flat, as soon as possible, salary by arrangement.—Box A.1887, B.M.J.

**Wanted, Assistant, outdoor. Car owner. No immediate view.** Salary £1,200 per annum, including car allowance. Liverpool.—Box A.1861, B.M.J.

**Wanted, Doctor to take two evening surgeries** per week only.—Tel. Bolton 678.

**Wanted, Assistant, Rural practice Midlands, for** partnership of three, N.H.S. 5,300. Preference will be given to applicant with Obstetric experience, public school education, married and a car owner. Free furnished house available. No view at present. Commencing salary £1,000 including car allowance —Box A.1751, B.M.J.

**Wanted, by S. Yorks partnership, young, male** and preferably unmarried, Assistant with car. Good prospects. Rota. £100 per annum car allowance. Salary £1,050 per annum.—Box A.1901, B.M.J.

**Wanted, experienced Assistant with view to partnership.** End of November. Calder Valley, Yorkshire. Car owner. House available. Central heating. Garden.—Box A.1881, B.M.J.

**Wanted immediately, Assistant, male or female,** full-time. Car owner. Furnished flat available, all facilities. Woolwich area. No children.—Box A.1882, B.M.J.

**Wanted, indoor Assistant, either sex, single.** Yorkshire industrial practice. Particulars on application.—Box A.1667, B.M.J.

**Wanted, male Assistant for North-West Kent** practice. G.P. and midwifery experience essential. £1,000 per annum.—Box A.1863, B.M.J.

**Wanted, male British married Assistant for large** practice in North-East Lancs town. Unfurnished house available to rent. Must have G.P. experience and car. Early view to partnership. Salary by arrangement.—Box A.1864, B.M.J.

**Wanted, outdoor Assistant, Central London. Car** owner. £1,000 per annum. Free accommodation single man. Rota. No view. Usual bond.—Box A.1884, B.M.J.

**Assistant early view Coventry. Please state age,** experience, availability, enclosing copies testimonials.—Box A.1885, B.M.J.

**Assistant required. Car essential. Pleasant prac**tice. Salary £1,000 per annum. Car allowance £150, no immediate view.—Box A.1888, B.M.J.

**Doctor wanted for evening surgeries and to be** on call at night. N.W.1 district. Close to teaching hospitals. Suitable for postgraduate.—Box A.1871, B.M.J.

## Assistantships Vacant—contd.

**Lady Assistant required by lady G.P. with rapidly** expanding practice. Part-time duties at commencement. Excellent prospects for conscientious doctor desiring full-time assistantship or view. Previous G.P. experience not essential. Large self-contained flat and garage available free of charge. Suit married doctor with family.—Box A.1862, B.M.J.

**Married Assistant required November 1, pleas**ant E. Yorks country district, three partners, unfurnished flat available, regret no view.—Box A.1886, B.M.J.

**Part-time female Assistant (outdoor), with car,** required for Partnership in S.W. London.—Box A.1883, B.M.J.

**Part-time, Worsley. £500 per annum.—Box** A.1872, B.M.J.

## ASSISTANTS AVAILABLE

**Assistantship required. M.B., B.Ch., 28, married** (wife M.B., B.Ch.), car, Protestant. H.S., H.P., anaesthetics, R.A.M.C., traineeship. Available December.—Box A.1855, B.M.J.

**Assistantship with definite view required by** experienced Jewish M.B., aged 33, single; car owner. London area or environs.—Box A.1851, B.M.J.

**Assistantship with view wanted by London M.B.,** B.S., 1951. Age 29, single, Church of England. Two years' general practice, obstetrics. Rural practice preferred. Any part of England or Wales. —Box A.1854, B.M.J.

**Glasgow, M.B., Ch.B. (1951), D.P.M., 28,** married, three daughters. Beginning psychoanalytic training in London. Urgently needs furnished house or flat. Do evening surgeries or other part-time G.P. duties.—Box A.1866, B.M.J.

**Liverpool graduate, 30, married, car, seeks Assist**antship, preferably urban, with view. R.A.M.C., H.S., H.P., obstetrics, completes Traineeship October.—Box A.1873, B.M.J.

**M.B., Hospital and G.P. experience, aged 31,** own car, on telephone, would do night calls in central London.—Box A.1768, B.M.J.

**Postgraduate available October, evening surgeries,** weekends, night duty, London area. Extensive experience, car, accommodation required.—Box A.1865, B.M.J.

## TRAINEE GENERAL PRACTITIONERS (Vacant)

**Wanted, Trainee, male or female, October,** outdoor.—Dr. Campbell, Lochmaben, Dumfriesshire.

**Wanted, Trainee, November. Delightful rural** dispensing practice, Cumberland. Married, unfurnished cottage available. Single—live out. Car owner. Congenial working conditions. Excellent universal experience.—Box T.1787, B.M.J.

**Merseyside. Wanted, Trainee for med'um-sized** partnership (husband, wife). Furnished flat available.—Box T.1891, B.M.J.

**Trainee, male or female, pleasant North London** suburb. Live out. Car necessary.—Dr. T. D. Herriott, 2, Maidstone Road, N.11. Bow 1734.

**Trainee required, immediately, either sex, London,** N.16. Car owner. Live out. Ample time for study.—Box T.1892, B.M.J.

**Trainee required October. Dispensing, semi-rural,** S.E. Coast. Car owner. Live out.—Box T.1890, B.M.J.

**Trainee required, North London. Maximum** salary. Free accommodation. Live out if married. —Box T.1867, B.M.J.

**Trainee required for partnership practice in North** Manchester.—Box T.1894, B.M.J.

**Trainee wanted October, married. Car owner.** Pleasant rural Lake District practice. Cottage hospital. House available semi-furnished. References. Excellent experience. Salary £775. Car £150.—Box T.1893, B.M.J.

**Traineeship offered by partnership of three** doctors. Country practice near Cambridge. Salary £775, car allowance.—Box T.1895, B.M.J.

## LOCUMS (Vacant)

**Wanted, Locum, Indian, six weeks. November 5,** near London.—Apply Box L.1897, B.M.J.

**Locum required, single, own car, partnership** practice. For five weeks starting immediately. Telephone Stoke-on-Trent 22648.—Box L.1880, B.M.J.

**Locum wanted September 29 to October 14. One** partner remaining, own car, live in.—Box L.1874, B.M.J.

**Locum with car wanted at once for four weeks.** Senior partner remaining. Attractive practice.—Box L.1889, B.M.J.

### Royal Northern Hospital, Holloway, N.7

**Locum Medical Registrar**

required for two or more weeks, from October 1. Apply to Hospital Secretary. (8344)

### St. James' Hospital, Balham, S.W.12

**Locum Senior House Officer (Casualty)**

required from October 8 for two weeks. Applications, giving full particulars and two referees, to the Group Secretary, at above address, immediately. (8416)

### Willesden General Hospital, Harlesden Road, N.W.10

**Locum Resident Casualty Officer (S.H.O.)**

wanted October 12 to 26. Apply Hospital Secretary. (8304)

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### Blackburn and District Hospital Management Committee

**Locum Registrar (Anaesthetics)**

required from October 7. Apply to Secretary, H.M.C. Office, Royal Infirmary, Blackburn, Lancs. (8219)

### Bournemouth and East Dorset Hospital Management Committee

**Royal Victoria Hospital, Westbourne, Hants**

**Locum Senior House Officer (Resident)**

required for E.N.T. and Ophthalmic duties for an indefinite period from September 22, 1956. Applications to the Hospital Secretary, Royal Victoria Hospital, Shelley Road, Boscombe, Bournemouth. (8204)

### Bournemouth and East Dorset Hospital Management Committee

**Royal Victoria Hospital, Shelley Road, Boscombe, Bournemouth**

**Locum Medical Registrar (Resident)**

required for the period October 2 to December 12, 1956. Applications to the Hospital Secretary. (8242)

### Chelmsford, St. John's Hospital

**Locum Resident Anaesthetist Registrar**

required to commence September 27 for approximately six weeks. Applications to the Group Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, London Road, Chelmsford, Essex. (8243)

### Leicester General Hospital

**Locum Senior House Officer**

required in Obstetrics and Gynaecology for at least one month. Applications, with copies of testimonials, to Secretary as soon as possible. (8220)

### Redhill County Hospital, Earlswood Common, Redhill, Surrey

**Locum Anaesthetic Registrar**

Required for indefinite period from October 1, pending filling of vacancy for two-year appointment. Married quarters available. Salary £17 10s. per week. Apply, Group Secretary, Redhill H.M.C., Earlswood Mount, Pendleton Road, Redhill. (Redhill 3581, Ext. 20.) (8221)

### Rochford, Essex, General Hospital

**Locum Geriatric Registrar**

required from October 1 to 14, 1956. Applications, stating age, etc., to the undersigned as soon as possible.—J. C. Field, Secretary. (8356)

### Royal Buckinghamshire Hospital, Aylesbury, Bucks

**Locum Obstetric House Officer**

required for the period October 8 to 14. Apply, with copies of two testimonials, to Secretary Superintendent, as soon as possible. (8245)

### Sheffield Regional Hospital Board

**Locum Resident Registrar (Anaesthetics)**

required immediately at the General Hospital, Grimsby, one month in first instance. Remuneration £17 10s. per week, less deduction for residence. Apply Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, naming two referees. (8222)

### Sheffield Regional Hospital Board

**Locum for Whole-time Assistant Ophthalmologist**

required immediately with duties at Leicester Royal Infirmary and associated clinics. Remuneration 31½ guinneas per week. Apply Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, naming two referees. (8259)

### South Cheshire Hospital Management Committee

**Crewe and District Memorial Hospital (108 beds and Annexe 34 beds—Acute)**

**Locum Registrar (Surgical)**

required at the above Hospital (approved for F.R.C.S.) for the month of October. Applications, with full details, immediately to the Group Secretary, Barony Hospital, Nantwich, Cheshire. (8404)

## LOCUMS (Available)

**Registered practitioner available. Own car. Live** in.—Box L.1896, B.M.J.

**Single, experienced, car owner, October 2 on**wards. Yorks preferred.—Darlington 3879 evenings.

## SITUATIONS (Wanted)

**M.R.C.S. (1950). Age 39. Active service N.W.** Europe (student). Three years' clerical experience. Two years' hospital and four years' G.P. experience. Seeks situation in commerce or industry.—Box S.1856, B.M.J.

# APPOINTMENTS

## ANAESTHETICS

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**PART-TIME CONSULTANT ANAESTHETIST**

(six half-days per week) required for the Fulham and Kensington Group of Hospitals, duties mainly at St. Mary Abbots Hospital, W.8. Applications by letter (five copies), giving date of birth, qualifications, experience, three referees, to Secretary (S.1), S.W. Met. R.H.B., 11a, Portland Place, W.1, by October 20, 1956. Applicants may visit hospital by local arrangement. (8201)

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**WHOLE-TIME CONSULTANT ANAESTHETIST**

required for the Wandsworth Group of Hospitals. Duties mainly at St. James' Hospital, Balham, S.W.12. Applications, by letter (five copies), giving date of birth, qualifications, experience, three referees, to Secretary (S.1), S.W.Met.R.H.B., 11a, Portland Place, W.1, by October 20, 1956. Applicants may visit hospital by local arrangement. (8271)

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**PART-TIME CONSULTANT ANAESTHETIST**

(two half-days per week) required for the St. Helier Group of Hospitals. Duties mainly at the Nelson Hospital, S.W.20. Applications by letter (five copies), giving date of birth, qualifications, experience, three referees, to Secretary (S.1), S.W. Met. R.H.B., 11a, Portland Place, W.1, by October 20, 1956. Applicants may visit hospital by local arrangement. (8203)

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**PART-TIME CONSULTANT ANAESTHETIST**

(seven half-days per week) required for the Redhill (Surrey) Group of Hospitals. Successful candidate will be expected to reside within the Group area. Applications, by letter (five copies), giving date of birth, qualifications, experience, three referees, to Secretary (S.1), S.W. Met. R.H.B., 11a, Portland Place, W.1, by October 20, 1956. Applicants may visit hospital by local arrangement. (8202)

### NORTHERN REGIONAL HOSPITAL BOARD (Scotland)

Applications are invited for the whole-time post of

**ASSISTANT ANAESTHETIST (Senior Hospital Medical Officer grade)**

based on the Inverness Hospitals. Candidates should have a higher qualification in Anaesthetics. Schedules of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by October 15, 1956. —A. M. Fraser, M.D., Secretary and Administrative Medical Officer, Office of the Northern Regional Hospital Board, Raigmore, Inverness. (8420)

## Anaesthetics—contd.

**N.E. METROPOLITAN REGIONAL HOSPITAL BOARD**

**ANAESTHETIC REGISTRAR**
**(Resident or Non-resident near Hospital)**
**St. Leonard's Hospital, N.1**

Recognized for D.A.

**ANAESTHETIC REGISTRAR**
**(Resident or Non-resident near Hospital)**
**St. Andrew's Hospital, Billericay, Essex**

Recognized for D.A. and F.F.A. Appointments subject to review after one year. Application forms from Secretary, 11, Portland Place, W.1, to be returned by October 6. (8305)

**THE HOSPITAL FOR SICK CHILDREN**
**Great Ormond Street, London, W.C.1**

There will be a vacancy on November 22, 1956, for a

**RESIDENT ANAESTHETIST (Registrar Grade)**

Full particulars, with form of application, which must be returned not later than Monday, October 15, 1956, may be obtained from the undersigned.—H. F. Rutherford, House Governor and Secretary. (8[illegible])

**BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE**

**REGISTRAR (Anaesthetics)**

required. Resident post. Married accommodation available if desired. Duties mainly at Blackburn Royal Infirmary with sessions at Victoria Hospital, Accrington, and Queen's Park Hospital, Blackburn, as arranged by Consultant-in-charge. Post recognized for D.A. and F.F.A.R.C.S. Application forms available from Secretary, H.M.C. Office, Royal Infirmary, Blackburn, Lancs. (8223)

**EASTERN REGIONAL HOSPITAL BOARD (Scotland)**
**Anaesthetics, Perth Area**

Applications are invited for the post of
**REGISTRAR IN ANAESTHETICS**
in the Perth Area, based on Perth Royal Infirmary (272 beds) and Bridge of Earn Hospital (806 beds). Living-in accommodation available at Bridge of Earn Hospital. Further particulars and forms of application from the Secretary to the Board, "Bracknowe," 430, Blackness Road, Dundee, with whom applications must be lodged not later than September 29, 1956. (8361)

**LEEDS REGIONAL HOSPITAL BOARD**

**REGISTRAR IN ANAESTHETICS**

Huddersfield Group. (Approximately 225 beds in the Surgical Specialties.) Non-resident. Applications, stating age, qualifications, and details of present and previous appointments (with dates), together with the names and addresses of three referees, to the Secretary, Joint Registrars Committee, Park Parade, Harrogate, by September 28, 1956. (7949)

**SHEFFIELD REGIONAL HOSPITAL BOARD**

**WHOLE-TIME RESIDENT OR NON-RESIDENT REGISTRAR (Anaesthetics)**

required at the City General Hospital, Sheffield. Recognized for the F.F.A.R.C.S. examination. Post vacant November 25, 1956. Successful candidate to reside in hospital when "on call." This is a large general hospital (652 beds) with a Department of Thoracic Surgery, a Regional Cardiological Centre, and a Professorial Gynaecological Unit. Appointment for one year in first instance. Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, by October 1, 1956, giving age, nationality, qualifications, present and previous appointments (with dates), naming three referees. (8224)

**SHEFFIELD REGIONAL HOSPITAL BOARD**

**Derbyshire Royal Infirmary (416 beds)**
**(Derby Group recognized for training for F.F.A. and D.A.)**

**WHOLE-TIME RESIDENT REGISTRAR (Anaesthetics)**

required. Duties will include attendances at other hospitals in the Group. Appointment for one year in first instance. Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, by October 1, 1956, giving age, nationality, qualifications, present and previous appointments (with dates), naming three referees. (8225)

**SOUTH CHESHIRE HOSPITAL MANAGEMENT COMMITTEE**

**Crewe and District Memorial Hospital**
**(108 beds and Annexe 34 beds—Acute)**

**J.H.M.O. (ANAESTHETICS)**

three years' appointment, D.A. preferred. New operating suite to be opened shortly. Duties chiefly at general hospital and a Maternity Unit at another hospital. Hospital approved for D.A. Salary and conditions as per regulations. Applications, giving age, details of experience, and names of three referees, immediately to Group Secretary, Barony Hospital, Nantwich, Cheshire. (8305)

**NELSON HOSPITAL**
**Kingston Road, Merton, S.W.20**

**RESIDENT ANAESTHETIST**
**(Senior House Officer Grade)**

Applications, stating age, experience, and qualifications, with copies of testimonials and the name of one referee, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey. (8226)

**BLACKPOOL, VICTORIA HOSPITAL (348 beds)**

**SENIOR HOUSE OFFICER (Anaesthetics)**

Post recognized for the F.F.A.R.C.S. and D.A., and vacant from mid-December. This is a busy general hospital offering a sound and varied experience in anaesthetics. Applications, giving age, qualifications, experience and the names and addresses of two referees, should be sent to the Hospital Secretary. (8227)

**DUDLEY, THE GUEST HOSPITAL (154 beds)**

**SENIOR HOUSE OFFICER (Anaesthetics)**

Post now vacant. Apply Group Secretary, Guest Hospital, Dudley. (7052)

**MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE**

**All Saints' Hospital, Chatham, and St. Bartholomew's Hospital, Rochester**

**S.H.O. IN ANAESTHETICS**
**(Recognized for the F.F.A.R.C.S.)**

Applications are invited for the above post, vacant now, and tenable for one year—six months at each Hospital. Salary £745, less £150 per annum if resident. Applications, giving full particulars, to be addressed to the Group Secretary, 20, Star Hill, Rochester, Kent. (8289)

**PEMBURY HOSPITAL**
**Pembury, near Tunbridge Wells (387 beds)**

**Tunbridge Wells Group Hospital Management Committee**

Applications invited for post of
**RESIDENT ANAESTHETIST**
**(Senior House Officer)**

vacant November 1. Post tenable for twelve months in the first instance and recognized for the D.A. and F.F.A.R.C.S. National Health Service salary, less £150 per annum for residence. Apply, stating age, qualifications and experience, together with three testimonials, to the Group Secretary, Sherwood Park, Pembury Road, Tunbridge Wells. (8084)

**PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE**

**Royal Portsmouth Hospital**

**ANAESTHETIST (S.H.O. Grade)**

Recognized for F.F.A.R.C.S. Vacant October 1, 1956. Applications, stating age, experience and qualifications, together with the names of two referees, should be forwarded as soon as possible to E. H. Hurst, St. Mary's Hospital, Milton Road, Portsmouth. (7743)

**QUEEN VICTORIA HOSPITAL**
**East Grinstead, Sussex**
**Plastic Surgery and Jaw Injuries Centre**

**Tunbridge Wells Group Hospital Management Committee**

**SENIOR HOUSE OFFICER in Anaesthetics**

Applications invited for above resident appointment vacant December 7, 1956. Duties in anaesthesia for both General and Plastic Surgery. Post recognized for the Examinations of D.A. and F.F.A.R.C.S. Apply, stating qualifications, experience and age, and names of three referees, by October 27, 1956, to Group Secretary, Sherwood Park, Pembury Road, Tunbridge Wells. (8281)

**ROYAL CORNWALL INFIRMARY, Truro (212 beds)**

Applications are invited for the post of
**SENIOR HOUSE OFFICER**

Anaethetist post is recognized for training for the Diploma in Anaesthetics. Applications, stating age, nationality, qualifications and experience, together with copies of two recent testimonials, to be addressed to the Hospital Secretary, Royal Cornwall Infirmary. (8003)

**TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE**

**TWO SENIOR HOUSE OFFICERS (Anaesthetics)**

required for the Tees-side Group of Hospitals, one post vacant now and one vacant October 15. The Group is recognized for the F.F.A. and D.A. Facilities are available for post-graduate study and emergency work is by rota. Applications, with copies of three testimonials, to Dr. J. G. Warnock, North Ormesby Hospital, Middlesbrough. (7936)

**STAFFORD HOSPITAL MANAGEMENT COMMITTEE**

**SENIOR HOUSE OFFICER (Anaesthetics)**

Male or female. Resident. Recognized for D.A. Applications to Group Secretary, Stafford H.M.C., 13, Forebate Street, Stafford. (7192)

**NORTHAMPTON GENERAL HOSPITAL (482 beds)**

Vacancy October 1, 1956, for
**HOUSE OFFICER**

Department of Anaesthetics. Recognized for D.A. Six months' appointment in first instance. Applications as soon as possible to S. G. Hill, Superintendent. (7137)

**ROYAL HAMPSHIRE COUNTY HOSPITAL**
**Winchester (313 beds)**

**HOUSE OFFICER (Anaesthetics)**

Post vacant November 10. The hospital is recognized for the F.F.A.R.C.S. and D.A. Applications, with copies of two testimonials, to the Group Secretary. (8378)

## CARDIOLOGY

**HOSPITALS FOR DISEASES OF THE CHEST**

**London Chest Hospital**

**MEDICAL REGISTRAR, Cardiac Department**

Applications are invited for this post, which is graded Registrar. Previous experience in cardiology and cardiac catheterization desirable but not essential. The appointment is for one year with eligibility for reappointment. Applications, stating date of birth and qualifications (with dates), accompanied by copies of three testimonials, should reach the undersigned not later than October 6, 1956.—Thomas Brown, House Governor, London Chest Hospital, E.2. (8026)

**THE UNITED LIVERPOOL HOSPITALS**

**Royal Liverpool Children's Hospital**

Applications are invited for a resident post of **SENIOR HOUSE OFFICER in Paediatrics, for duty principally in the Cardiological Department,** for the period to September 30, 1957. Apply, by October 5, 1956, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney Street, Liverpool, 1. (8321)

**BROMPTON HOSPITAL, S.W.3**

Applications invited for the post of:
**RESIDENT HOUSE PHYSICIAN**
**to Cardiac Department**

for six months from December 1, 1956. Duties include work in out-patient department and wards. Salary at rate of £525 per annum. Applications, stating age, qualifications (with dates), nationality and appointments held, together with copies of testimonials, by October 6, 1956, to Kenneth A. F. Miles, House Governor. (8387)

## CASUALTY

**CHESTER ROYAL INFIRMARY**

Applications are invited for the post of
**RESIDENT CASUALTY OFFICER J.H.M.O.**

The post is recognized for the F.R.C.S. Applications, giving full details, together with the names and addresses of two referees, should be forwarded to the Group Secretary, 5, King's Buildings, Chester. (8124)

**NUNEATON, MANOR HOSPITAL (125 beds)**

**RECEIVING ROOM OFFICER**

for Casualty duties. Resident, furnished flat available. J.H.M.O. status. Recognized F.R.C.S. Applications to Hospital Secretary. (7921)

**RUGBY, HOSPITAL OF ST. CROSS (168 beds)**

**CASUALTY AND ACCIDENT OFFICER**
**(J.H.M.O.)**

Recognized F.R.C.S. Resident. Duties include Orthopaedic Surgery. Apply Hospital Secretary. (8210)

**SCARBOROUGH HOSPITAL (General, 190 beds)**

Applications are invited for the post of
**NON-RESIDENT CASUALTY OFFICER**
**(Junior Hospital Medical Officer)**

to commence duty approximately November 1, 1956. Terms and conditions of service in accordance with those prescribed for Medical and Dental Staffs. A furnished cottage is available for the successful applicant in the grounds of Cross Lane Hospital (1 mile distant), for which the present rent is £7 19s. 9d. per month. Applications, giving age, qualifications, details of present and previous appointments, and the names of two referees, should be forwarded to the Hospital Secretary. (8088)

## Casualty—contd.

**CONNAUGHT HOSPITAL, Walthamstow, E.17 (118 beds)**

Applications are invited for the post of
**SECOND CASUALTY OFFICER**
with duties in the Department of Orthopaedic and Traumatic Surgery (Senior House Officer Grade) recognized for F.R.C.S. Salary £745 per annum, less £150 per annum for board lodging, etc. Applications, with full details, and copies of two recent testimonials, should be sent immediately to Secretary, H.M.C., Forest Group, Langthorne Road, E.11. (7965)

**DREADNOUGHT SEAMEN'S HOSPITAL Greenwich, S.E.10**

**CASUALTY AND RECEIVING ROOM OFFICER (Non-resident)**
required on October 22. Post recognized by the Royal College of Surgeons. Salary £745 per annum. Applications, stating age, nationality, qualifications and experience, with the names of three recent referees, should be sent to the Secretary at the above address not later than October 8. (8383)

**THE LONDON HOSPITAL Whitechapel, E.1**

Applications are invited for the post of
**SENIOR HOUSE OFFICER**
to the Receiving Rooms, becoming vacant on December 1. The appointment will be for six months only, and in view of the nature of the duties preference will be given to applicants who have held a previous appointment at the London Hospital. Applications (six copies), together with six copies of three recent testimonials, should be received by the undersigned by October 3, 1956.—H. Brierley, House Governor. (8284)

**CAERNARVON AND ANGLESEY HOSPITAL MANAGEMENT COMMITTEE**

Applications are invited for the post of
**SENIOR HOUSE OFFICER (Non-resident)**
in the Casualty Department of the C. and A. General Hospital, Bangor. Salary £745 per annum. Applications, stating age, experience and nationality, together with the names and addresses of two referees, to be sent to the Group Secretary, Plas Gwyn, Ffriddoedd Road, Bangor, within ten days of appearance of this advertisement. (8359)

**CHESTERFIELD HOSPITAL MANAGEMENT COMMITTEE**

**SENIOR HOUSE OFFICER**
required October 1 at Chesterfield Royal Hospital for Accident and Orthopaedic Department. Post recognized for F.R.C.S. training and offers valuable experience. National salary and conditions. Apply M. H. Boone, Secretary. (7922)

**COLCHESTER HOSPITAL MANAGEMENT COMMITTEE**

Applications are invited for:
**Essex County Hospital, Colchester (188 beds)**
**SENIOR HOUSE OFFICER (Casualty and E.N.T.)**
**SENIOR HOUSE OFFICER (Casualty and Radiotherapy)**
Posts recognized for F.R.C.S., tenable for six months or one year. Applications, with copies of three testimonials, to Group Secretary, 14, Pope's Lane, Colchester, Essex. (8369)

**CROYDON GENERAL HOSPITAL (200 beds)**

**CASUALTY OFFICER (S.H.O., resident)**
Post vacant October 22, 1956. Recognized for final F.R.C.S. examination. There is a Registrar in charge of Department. Application forms obtainable from George A. Paines, Group Secretary, Croydon Hospital Management Committee, General Hospital, Croydon. (8228)

**DUDLEY, THE GUEST HOSPITAL (154 beds)**

**SENIOR HOUSE OFFICER (Casualty)**
Post now vacant. Apply Group Secretary, Guest Hospital, Dudley, Worcs. (7054)

**MANSFIELD AND DISTRICT GENERAL HOSPITAL**

Applications are invited for the post of
**SENIOR HOUSE OFFICER**
to the Casualty and Orthopaedic Department (one of two posts). Vacant October 23. The post is recognized for F.R.C.S. Regulations. Applications, stating qualifications, age, experience, etc., to be forwarded to the Secretary, Mansfield Hospital Management Committee, Crow Hill Drive, Mansfield, Notts. (7986)

**NOTTINGHAM GENERAL HOSPITAL**

Applications are invited from Registered Medical Practitioners for the post of
**SENIOR HOUSE OFFICER (Casualty)**
duties to commence on or about September 7. Establishment 3. Recognized for F.R.C.S. Post offers wide experience of Casualty work. Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham. (7140)

## IMPORTANT NOTICE
### APPOINTMENTS

Medical practitioners are requested

**not to apply**

for any appointment specified in this notice or for any appointment under an authority referred to in this notice without first communicating with the Secretary of the British Medical Association, B.M.A. House, Tavistock Square, London W.C.1, or in the case of the Irish appointment, with the Medical Secretary of the Irish Medical Association, 10, Fitzwilliam Place, Dublin, to learn the views of the Association regarding the terms and conditions of service pertaining to the appointment:

**COUNTY BOROUGH OF MIDDLESBROUGH**
**REPUBLIC OF IRELAND,**
**PORTIUNCULA HOSPITAL,**
**BALLINASLOE, CO. GALWAY,**
Visiting Staff.
**GOVERNMENT OF CYPRUS**

By Order of the Council,
**A. MACRAE,**
September 18, 1956. Secretary.

**SIDCUP AND SWANLEY HOSPITAL MANAGEMENT COMMITTEE**

**SENIOR HOUSE OFFICER**
**(Casualty and Orthopaedic)**
required from November 1, 1956. The successful applicant will serve three months as Casualty Officer and three months in the Orthopaedic Department. The post is recognized under the Fellowship Regulations as a period of six months' Casualty training. Applications, stating age, qualifications, and experience, together with names and addresses of two referees, should be sent to Secretary, Queen Mary's Hospital, Sidcup, Kent. (8328)

**SOUTH MANCHESTER H.M.C.**

**Wythenshawe Hospital, Manchester, 23**

Applications are invited from registered medical practitioners for the post of
**CASUALTY OFFICER (Senior House Officer grade)**
at Wythenshawe Hospital. This post is recognized by the Royal College of Surgeons. Applications, stating age, qualifications, present post, and names of two referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, within seven days of the appearance of this advertisement. (8342)

**PADDINGTON GREEN CHILDREN'S HOSPITAL**
**(St. Mary's Hospital, W.2)**

Applications are invited for the post of
**CASUALTY OFFICER**
Post-registration appointment, non-resident, House Officer grade, tenable for six months, as from November 1, 1956. Applications, stating age, nationality, qualifications (with dates), and experience, with copies of three recent testimonials, should reach the Secretary not later than September 29, 1956. (8424)

**QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15**

**JUNIOR CASUALTY OFFICER**
**(House Officer, third post)**
required for six months, commencing as soon as possible. Applications, with copies of recent testimonials, to Hospital Secretary by September 27, 1956. (8345)

**READING, BATTLE HOSPITAL (391 beds)**

Applications are invited from registered medical practitioners for the post of
**RESIDENT JUNIOR HOUSE SURGEON**
in the Area Accident and Orthopaedic Department. Post vacant October 1 next. F.R.C.S. recognized. Also casualty duties. Salary £425 to £525 per annum, less £125 board-residence. Apply, stating age, qualifications with dates, nationality, present post with one copy of recent testimonial, to Hospital Secretary. (7341)

## CHEST AND TUBERCULOSIS
**(see also THORACIC SURGERY)**

**NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD**

**CONSULTANT PHYSICIAN**
whole-time, St. Pancras Chest Clinic, 26, Margaret Street, W.1. Good general medical experience and special experience in chest diseases essential. The physician appointed will have charge of 47 beds at Whittington Hospital, Highgate Wing. Post vacant March 18, 1957. Clinic may be visited by direct appointment. Application forms obtainable from and returnable to, Secretary, North-West Metropolitan Regional Hospital Board, 11a, Portland Place, W.1, before October 22, 1956. (8306)

**LONDON CHEST HOSPITAL**

**Hospitals for Diseases of the Chest**

Applications are invited for the post of:
**MEDICAL REGISTRAR**
The appointment is for one year in the first instance and is non-resident. Duties include Outpatients and Refill Clinic and attendance at the Country Branch, near Letchworth. Applications, stating date of birth, qualifications (with dates), and previous appointments held, with copies of three testimonials, should reach the undersigned not later than October 15.—Thomas Brown, House Governor, London Chest Hospital, E.2. (8349)

**LIVERPOOL REGIONAL HOSPITAL BOARD**

**Aintree Hospital**

Applications are invited for the post of
**REGISTRAR IN DISEASES OF THE CHEST**
with duties in the Regional Thoracic Service, mainly at the above hospital, together with a period of training at a non-tuberculous unit. Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James Street, Liverpool, 2, to be received not later than October 6, 1956.—Vincent Collinge, Secretary to the Board. (8381)

**NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD**

**REGISTRAR**
required for male and female Tuberculosis Wards at West Middlesex Hospital, Isleworth, with part-time duties at Ealing Chest Clinic. Full-time, non-resident. Experience in General Medicine advisable and in Tuberculosis essential. The Hospital and Clinic may be visited by direct appointment. Application forms obtainable from, and returnable to, Group Secretary, South-West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by October 3, 1956. (8340)

**SHEFFIELD REGIONAL HOSPITAL BOARD**

**Leicester Isolation Hospital and Chest Unit, Groby Road, Leicester (328 beds)**

**WHOLE-TIME RESIDENT REGISTRAR**
**(Chest and Infectious Diseases)**
required. Single accommodation available. This hospital is also a Thoracic Surgical Centre. Appointment for one year in first instance. Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, by October 1, 1956, giving age, nationality, qualifications, present and previous appointments (with dates), naming three referees. (8231)

**SHEFFIELD REGIONAL HOSPITAL BOARD**

**Markfield Hospital (163 beds)**

**WHOLE-TIME RESIDENT REGISTRAR OR S.H.O. (Chest Diseases)**
required. Duties will include attendance at Chest Clinics associated with Hospital under supervision of the Consultant. Minor Thoracic procedures are carried out and the staff closely associated with the neighbouring major Thoracic Surgical Unit. Remuneration according to status. Apply for one year in the first instance. Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, by October 1, 1956, giving age, nationality, qualifications, present and previous appointments (with dates), naming three referees. (8230)

**IMPORTANT: All intending applicants should read the revised NOTICE at the top of page 28**

## Chest and Tuberculosis—contd.

**SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD**

**Epsom Group Hospital Management Committee**

Applications are invited for whole-time
**REGISTRAR IN CHEST MEDICINE**
to the Epsom and Dorking Chest Clinics. Vacancy December 1, 1956. Duties will include sessions at one or both clinics. Additionally, person appointed will be Registrar at Cheam Sanatorium, where there are 53 beds for the treatment of cases of pulmonary tuberculosis, and will have the day-to-day care of patients under the various Consultants concerned. Successful candidate will be required to live within easy access of Cheam Sanatorium. Applicants may visit Units by arrangement with Consultant Chest Physician. Application forms may be obtained from Group Secretary, Epsom District Hospital, Dorking Road, Epsom (send stamped addressed foolscap envelope), for completion and return within 14 days. (7953)

**GLASGOW, N.1, STOBHILL GENERAL HOSPITAL**

Applications are invited for the post of
**JUNIOR HOSPITAL MEDICAL OFFICER**
**in the Pulmonary Tuberculosis Unit (31 beds)**
with an attachment to the associated chest clinic. There are ample opportunities for the study of all forms of chest disease and general medical cases. Applications, stating age, qualifications, and experience, with the names of two referees, to be sent to the Medical Superintendent. (8334)

**READING & DISTRICT HOSPITAL MANAGEMENT COMMITTEE**

Applications are invited for the appointment of
**JUNIOR HOSPITAL MEDICAL OFFICER**
in the Area Department of Diseases of the Chest, for duty in the Reading Chest Clinic. The post offers wide experience in both tuberculosis and non-tuberculous chest diseases and duties will include attendance at Prospect Park Hospital, Reading, and Penpard Chest Hospital, Henley. Facilities are available for post-graduate studies. Salary within the scale £775 to £1,075 per annum. Applications, stating age and qualifications, together with names of three referees, should be sent to the Group Secretary, 3, Craven Road, Reading. (6537)

**SKIPTON (near), GRASSINGTON HOSPITAL (208 beds)**

**JUNIOR HOSPITAL MEDICAL OFFICER**
required for the above hospital, which provides treatment for tuberculosis patients, men and women. Accommodation available for single applicants. Post tenable from September 1, 1956. Applications to Medical Superintendent. (6487)

**ALDINGBOURNE SANATORIUM (71 beds) and BOGNOR REGIS ANNEXE (49 beds)**

**SENIOR HOUSE OFFICER (Male or female)**
Required immediately for work in wards and out-patient clinics. Liaison with Thoracic Units at Chichester and King Edward VII Sanatorium, Midhurst; resident at Bognor Regis. Apply to Physician Superintendent, Aldingbourne Sanatorium, near Chichester. (7990)

**EPPING, ST. MARGARET'S HOSPITAL (480 beds)**

**RESIDENT SENIOR HOUSE OFFICER**
Post vacant November 1, 1956. Required for Chest Department and to act as Second Resident Anaesthetist. Good opportunity for experience in modern methods. Previous experience in Chest diseases desirable but not essential. Applications, with references, to reach Group Secretary, Epping Group H.M.C., Oak Cottage, The Plain, Epping, Essex, by September 28. (8004)

**HERTS AND ESSEX GENERAL HOSPITAL**
**Bishop's Stortford, Herts (400 beds)**
**(Midway between London and Cambridge. Main Line Railway from Liverpool Street)**

**SENIOR HOUSE OFFICER (Medical)**
for duties mainly in Tuberculosis Unit of 43 male and 23 female beds. Salary £745 per annum, less £150 in respect of residential emoluments. Appointment to commence November 1, for period of twelve months. Applications, stating qualifications, nationality, age and experience, with copies of testimonials or the names of two referees, should be sent to the Hospital Secretary. (8297)

**NORTHAMPTON (near), CREATON SANATORIUM**

Applications are invited from suitably qualified medical practitioners for the post of
**SENIOR HOUSE OFFICER**
The Sanatorium has 138 beds and is for the treatment of both pulmonary and non-pulmonary tuberculosis. There is a new major thoracic surgical unit for T.B. and non-tuberculous diseases of the chest. Applications, stating age, experience and qualifications, together with the names and addresses of two referees, should be sent to the Secretary, Northampton and District Hospital Management Committee, General Hospital, Northampton. (8261)

**BROMPTON HOSPITAL, S.W.3**

Applications invited for the post of:
**NON-RESIDENT HOUSE PHYSICIAN**
for which there are three vacancies, for six months from December 1, 1956. Duties include work in out-patient department and wards, also one month's duty at Frimley as occasion demands. Salary at the rate of £525 per annum. Applications, stating age, qualifications (with dates), nationality and appointments held, together with copies of testimonials, by October 6, 1956, to Kenneth A. F. Miles, House Governor. (8388)

**SOUTH-WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE**

**West Middlesex Hospital, Isleworth**

**HOUSE OFFICER**
required for Tuberculosis Unit in large general Hospital. Postgraduate training facilities. Applications to Group Secretary, West Middlesex Hospital, Isleworth, by October 2, 1956. (8299)

## EAR, NOSE, AND THROAT, ETC.

**MANCHESTER REGIONAL HOSPITAL BOARD**

Part-time (8 half-days weekly)
**CONSULTANT E.N.T. SURGEON**
to North and Mid-Cheshire Hospitals (about four sessions, mainly at Altrincham General Hospital, E.N.T. Department) and Manchester Ear and Wythenshawe Hospitals (two sessions each). Wide experience and higher qualifications essential; appointee to live in Altrincham area. Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood Road, Manchester, 8, to be returned by October 5, 1956. (8293)

**ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL**
**Gray's Inn Road, W.C.1, and Golden Square, W.1**
**In association with the Institute of Laryngology and Otology**

Applications are invited for a post of
**REGISTRAR or alternatively SENIOR HOUSE OFFICER**
A higher surgical qualification is required for the former grading and at least the Primary F.R.C.S. for the latter. Considerable clinical experience in general surgery and in this specialty is required for either post. The appointment will be in accordance with the terms and conditions of service for the appropriate grade in the National Health Service. Applications, giving full information and the names of two referees, should be sent to the House Governor by October 1. (8021)

**BANGOUR GENERAL HOSPITAL, West Lothian**
**Ear, Nose and Throat Unit**

Applications are invited for the post of
**REGISTRAR**
in the Ear, Nose and Throat Unit at Bangour General Hospital, Broxburn (15 miles from Edinburgh) which carries certain minimal duties at the Royal Infirmary, Edinburgh. The Unit comprises 40 beds and also undertakes Oral Dental Surgery. Salary and conditions of service will be in accordance with the regulations. Applications, giving age, qualifications and particulars of previous experience, should be lodged with the Group Secretary and Treasurer, Bangour General Hospital, Broxburn, West Lothian. (8365)

**THE UNITED BIRMINGHAM HOSPITALS**

Applications are invited for the appointment of
**NON-RESIDENT REGISTRAR**
**(E.N.T. Department)**
for duties within the United Hospitals. Applicants should have had previous experience in the specialty and a higher qualification is desirable. Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned not later than September 29, 1956. (8323)

**WELSH REGIONAL HOSPITAL BOARD**

**REGISTRAR, E.N.T. SURGERY**
based Caernarvon and Anglesey General Hospital, Bangor, with visits to Llandudno General and other hospitals in area. Non-resident. Subject to review end of first year. Application forms from S.A.M.O., Temple of Peace, Cathays Park, Cardiff, within fourteen days. (8294)

**BIRMINGHAM & MIDLAND EAR & THROAT HOSPITAL, Edmund Street, Birmingham, 3**

**SENIOR HOUSE OFFICER or HOUSE OFFICER**
(including pre-registration) required. Apply to Group Secretary, Dudley Road Hospital, Birmingham, 18. (8056)

**BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE**

**Royal Victoria Hospital, Westbourne, Hants**

Applications are invited for the appointment of
**RESIDENT SENIOR HOUSE OFFICER**
**for E.N.T. and Ophthalmic duties**
The appointment, which becomes vacant on September 22, 1956, is recognized for the D.O. and D.L.O. Diplomas. In addition to duties at the above hospital, the successful candidate will be required to assist in E.N.T. Out-patient Clinics at the Royal Victoria Hospital, Shelley Road, Bournemouth, and Poole General Hospital, Poole. Applications to the Hospital Secretary, Royal Victoria Hospital, Shelley Road, Bournemouth. (8205)

**NORTHAMPTON GENERAL HOSPITAL (482 beds)**

Vacancy October 1, 1956, for
**SENIOR HOUSE OFFICER**
Ear, Nose, and Throat Department. Recognized for F.R.C.S. and for D.L.O. Six months' appointment in first instance. Applications as soon as possible to S. G. Hill, Superintendent. (7143)

**ROYAL SOUTH HANTS HOSPITAL, Southampton (274 beds) and SOUTHAMPTON GENERAL HOSPITAL (472 beds)**

**SENIOR HOUSE OFFICER (E.N.T.)**
required beginning of October. This post is recognized for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work. The Group includes a diagnostic and distributing Hearing Aid Centre. Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar Street, Southampton. (7286)

**THE LEICESTER ROYAL INFIRMARY**

Applications are invited for the resident post of
**SENIOR HOUSE OFFICER**
to the Ear, Nose and Throat Department, for a period of 12 months commencing October 1. The post is recognized for the D.L.O. and F.R.C.S. Applications, stating age, qualifications and experience, together with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary. (7198)

**THE UNITED LEEDS HOSPITALS**

**The General Infirmary at Leeds**

**SENIOR HOUSE OFFICER IN EAR, NOSE AND THROAT DEPARTMENT**
required for a period of six months from November 1, 1956. The appointment will be renewable for a further period of six months. Terms and conditions of service of hospital medical staffs apply. Applications, giving details of age, qualifications, posts held (with dates), and with three names for reference, should be sent to the Secretary to the Board as soon as possible. (8077)

## GERIATRICS

**BIRMINGHAM REGIONAL HOSPITAL BOARD**

**PART-TIME CONSULTANT GERONTOLOGIST**
**(9 n.h.d. week's)**
Duties in the Wolverhampton Group, especially at New Cross Hospital (5 n.h.d. weekly), and Walsall Group, at St. John's Hospital (4 n.h.d. weekly). Experience specialty and higher qualification required. Fifteen copies application, naming three referees, to Secretary, 10, Augustus Road, Birmingham, 15, by October 8, 1956. Candidates may visit hospitals. (8246)

**ST. MATTHEW'S HOSPITAL, N.1**

**GERIATRIC REGISTRAR (Resident)**
Appointment subject to review after one year. Application forms from Secretary, N.E. Metropolitan Regional Hospital Board, 11a, Portland Place, W.1, to be returned by October 6. (8307)

**WALSALL HOSPITAL MANAGEMENT COMMITTEE**

**SENIOR HOUSE OFFICER**
required for geriatrics (mainly) and general medicine. Applications, together with names of two referees, to the Group Secretary, Walsall General (Sister Dora) Hospital. (8336)

**WATFORD, SHRODELLS HOSPITAL (General Hospital, 420 beds)**

Applications are invited for the post of
**SENIOR HOUSE OFFICER**
to the Geriatric Unit. This unit of 180 beds, under full-time Geriatrician, offers excellent clinical experience in diagnosis and treatment of acute and other illnesses in the elderly. Full laboratory and radiological facilities available. Adequate time for reading. Applications, together with copies of not more than two testimonials, to reach the Medical Officer-in-Charge as soon as possible. (8324)

## INFECTIOUS DISEASES

### LEEDS REGIONAL HOSPITAL BOARD

**REGISTRAR in Infectious Diseases**

Castle Hill Hospital, Cottingham (167 Infectious Diseases beds). Resident. Applications, stating age, qualifications and details of present and previous appointments (with dates), together with the names and addresses of three referees, to the Secretary, Joint Registrars Committee, Park Parade, Harrogate, by September 28, 1956. (7955)

### WELSH REGIONAL HOSPITAL BOARD

**REGISTRAR in Infectious Diseases**

Based City Isolation Hospital, Cardiff (219 beds). To serve Cardiff H.M.C. Resident/Non-resident. Subject to review end of first year. Application forms from S.A.M.O., Temple of Peace Cathays Park, Cardiff, within fourteen days. (8295)

## MEDICINE

### NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**MEDICAL REGISTRAR (Second)**

required at the Royal Northern Hospital, Holloway, N.7 (279 beds). Candidates may visit the hospital by direct appointment. Application forms obtainable from, and returnable to, the Secretary, Royal Northern Hospital, N.7, by October 2, 1956. (8346)

### MAIDENHEAD, CANADIAN RED CROSS MEMORIAL HOSPITAL, Taplow

**RESIDENT MEDICAL REGISTRAR**

required November. Application forms from, and returnable to, Secretary, Windsor Group H.M.C., Alma Road, Windsor, by September 30. (7924)

### WALSALL GROUP

**REGISTRAR, General Medicine**

(resident). Group appointment. Duties mainly at Manor Hospital. Experience specialty essential. Application forms from H.M.C. Secretary, General Hospital, Walsall, to be returned by October 1, 1956. Candidates may visit Hospital. (8263)

### WESTMINSTER HOSPITAL
**St. John's Gardens, S.W.1**

Applications are invited for the post of
**RESIDENT MEDICAL OFFICER (female)**
at Parkwood Auxiliary Hospital, Swanley, Kent, for one year in the first instance and renewable. Graded as Junior Hospital Medical Officer. A deduction of £170 per annum will be made from the salary for board residence. The post offers opportunity for study. Applications (4 copies), with names of two referees, to House Governor. (7785)

### SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN

Applications are invited for the post of
**SENIOR RESIDENT MEDICAL OFFICER (Women) (S.H.O. Grade)**
Appointment for six months; renewable. Duties include care of children's ward; Medical beds; E.N.T. and Administration. Offers suitable experience to those intending to enter General Practice. Vacant November 1, 1956. Application forms from the Secretary. (8264)

### THE LONDON HOSPITAL, Whitechapel, E.1

Applications are invited for the post of
**SENIOR HOUSE OFFICER**
to Medical Out-patients department. The post becomes vacant on December 1, and will be for six months in the first instance. Preference will be given to those trained at The London Hospital. Applications (six copies), together with six copies of three recent testimonials, should be received by the undersigned by October 3, 1956.—H. Brierley, House Governor. (8380)

### WANDSWORTH HOSPITAL GROUP

**St. James's Hospital, Balham, S.W.12**

**SENIOR HOUSE OFFICER**

to Medical Unit. Duties include staff examinations. Post vacant end of October. Applications, stating age, qualifications, experience, and two referees, to Group Secretary, at above address, by October 3. (42754) (8329)

### BANBURY, OXON, HORTON GENERAL HOSPITAL (163 beds)

**SENIOR HOUSE OFFICER (Physician)**

required immediately. Post provides experience in general medical and children's wards. Four other residents. Applications, stating age, nationality, qualifications, and names of two referees, to the Secretary. (6014)

### BEVERLEY, YORKSHIRE, WESTWOOD HOSPITAL (229 beds)

**HOUSE PHYSICIAN**

House Officer or Senior House Officer grading according to experience. Vacant end of September. Pre-registration post, but fully registered practitioners may apply. Applications to Group Secretary. (7958)

### BISHOP'S STORTFORD & DISTRICT HOSPITAL
**Rye Street, Bishop's Stortford, Herts**
**(67 beds, Medical, Surgical & Maternity)**

Applications are invited from registered medical practitioners for post of
**RESIDENT SENIOR HOUSE OFFICER (male)**
Salary £745 per annum, less £150 for residential emoluments. Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials, or names of referees, to Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts. (8029)

### BLACKPOOL AND FYLDE HOSPITAL MANAGEMENT COMMITTEE

**Victoria Hospital, Blackpool**

**SENIOR HOUSE OFFICER**

required in the Department of Medicine for one year from October 1, 1956. Applications, stating age, qualifications, and experience, should be sent to the Group Secretary. (8206)

### BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE

**Rossendale General Hospital, Rawtenstall**

Applications are invited for the post of
**SENIOR HOUSE OFFICER IN MEDICINE**
at the above hospital. Apply, stating age, experience, qualifications and two referees, to H. Wilkinson, Group Secretary, Bury General Hospital, Bury. (8352)

### ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE

**War Memorial Hospital,**
**Chase Side, Enfield, Middlesex**

**RESIDENT SENIOR HOUSE OFFICER**

required for general medical and surgical duties in this Acute General Hospital of 61 beds. Vacant mid-October. Twelve months' appointment. Deduction of £150 per annum for residential emoluments. Applications, with names and addresses of two referees, to the Group Secretary, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex. (8285)

### NORTH & MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE

**Altrincham General Hospital, Annexe and E.N.T. Department (183 beds)**

**SENIOR HOUSE OFFICER (Medical)**

This appointment is in a busy Hospital and offers excellent opportunities of practical experience. Post vacant end of September. Applications, together with two recent testimonials, to Group Secretary, The Hospital, Sinderland Road, Altrincham, Cheshire. (8207)

### CENTRAL MIDDLESEX HOSPITAL
**Park Royal, N.W.10**

Applications invited for following post-registration posts:

**RESIDENT HOUSE OFFICER**
in General Medical Department, including Haematology and Endocrinology. Vacant November 1.

**RESIDENT HOUSE OFFICER**
in General Medical and Neurological Department. Vacant November 9.

**RESIDENT HOUSE OFFICER**
in General Medical and Cardiological Department. Vacant November 8. Six months' appointments. Separate applications, with two copy testimonials, to Medical Director by September 29, 1956. (8308)

### MILE END HOSPITAL
**Bancroft Road, London, E.1 (484 beds)**

**HOUSE PHYSICIAN (Pre- or Post-registration)**

Post vacant October 18, 1956. Application forms, obtainable from Physician Superintendent, should be returned by September 28, 1956, with copies of not more than three testimonials. (8118)

### HULL (A) GROUP HOSPITAL MANAGEMENT COMMITTEE

**Hull Royal Infirmary (Sutton)**

Applications are invited for the post of
**HOUSE PHYSICIAN (House Officer Grade)**
Recognized for M.D. (Lond.) Examination. Vacant October. Salary and conditions of service are as those laid down nationally for Hospital Medical Staff. The appointment will be for six months, terminable by one month's notice either side. Applications to the Hospital Secretary, Hull Royal Infirmary. (8109)

### HULL "A" GROUP HOSPITAL MANAGEMENT COMMITTEE

**Western General Hospital, Hull (510 beds)**

Applications are invited for the post of
**JUNIOR HOUSE OFFICER (Medical)**
The post offers extensive experience in general medicine under the supervision of full-time and part-time consultant physicians. Applications to the Hospital Secretary as soon as possible. (8211)

### ROMFORD, ESSEX, VICTORIA HOSPITAL
**(99 beds)**

**RESIDENT HOUSE PHYSICIAN (Male)**

required immediately. (Post not approved for pre-registration purposes.) Applications should be forwarded to the Secretary, Romford Group H.M.C., Oldchurch Hospital, Romford. (6648)

### ROYAL SALOP INFIRMARY, Shrewsbury
**(216 beds)**

**HOUSE PHYSICIAN**

pre-registration or otherwise. Vacant November 1, 1956. Applications, with copy testimonials, to Group Secretary, Royal Salop Infirmary, Shrewsbury. (7938)

### ST. ANTHONY'S HOSPITAL
**Cheam, Surrey (162 beds)**

**RESIDENT HOUSE PHYSICIAN**

(Post registration). Good general experience under Consultant Staff. N.H.S. rates. Apply to the Secretary. (8414)

### CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE

**Dulwich Hospital, East Dulwich Grove, London, S.E.22 (in association with King's College Hospital Medical School for teaching purposes)**

Applications invited for appointment to two positions of
**HOUSE OFFICER (Medical duties)**
Recognized pre-registration posts. Vacant from October 1. Apply to Group Secretary, Dulwich Hospital, as soon as possible, enclosing copy testimonials, or names of two referees. (Pr.8247)

### ST. ANDREW'S HOSPITAL, Bow, E.3

Applications are invited for the appointment of
**HOUSE PHYSICIAN**
Recognized pre-registration post. Vacant on October 10, 1956, and tenable for six months. Applications, stating age and qualifications, with copy of at least one testimonial, should be sent immediately to the Hospital Secretary, St. Andrew's Hospital, Bow, E.3. (Pr.8394)

### LEEDS REGIONAL HOSPITAL BOARD

**HOUSE PHYSICIAN**

Recognized Pre-registration posts will be available for the six months commencing November 1, 1956, in the following hospitals approved under the Medical Act, 1950:

- Scarborough Hospital (191 beds)—1 vacancy
- Westwood Hospital, Beverley (202 beds)—1 vacancy
- East Riding Hospital, Driffield (249 beds)—1 vacancy
- Pinderfields Hospital, Wakefield (663 beds)—1 vacancy
- General Hospital, Dewsbury (119 beds)—1 vacancy
- Staincliffe Hospital, Dewsbury (314 beds)—1 vacancy (vacant now)
- Royal Halifax Infirmary (301 beds)—2 vacancies
- Halifax General Hospital (425 beds)—1 vacancy
- Bradford Royal Infirmary (507 beds)—1 vacancy
- St. Luke's Hospital, Bradford (828 beds)—2 vacancies
- Otley General Hospital (170 beds)—1 vacancy
- St. James's Hospital, Leeds (1,539 beds)—10 vacancies
- *Seacroft Hospital, Leeds (60 paediatric beds)—2 vacancies

*Recognized for D.C.H.

Application forms can be obtained from the Senior Administrative Medical Officer, Park Parade, Harrogate, or from the Dean, School of Medicine, Thoresby Place, Leeds, 2, and should be returned to either of the above named as soon as possible. Application may be made in advance of results of final examination. Candidates wishing to apply for posts at more than one hospital should complete a separate form in respect of each hospital. (Pr.7959)

### ROYAL SUSSEX COUNTY HOSPITAL (312 beds)

**2 HOUSE PHYSICIANS**

required mid-October and mid-November. Post recognized for pre-registration and F.R.C.S. Applications, stating usual particulars, and naming two referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7. (Pr.8325)

**IMPORTANT: All intending applicants should read the revised NOTICE at the top of page 28**

## Medicine—contd.

**ROYAL SOUTH HANTS HOSPITAL (274 beds) Southampton**

**TWO RESIDENT HOUSE PHYSICIANS**

required mid- and end October. Pre-registration candidates eligible. Applications, with copies of testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar Street, Southampton, as soon as possible. (Pr.8347)

## NEUROLOGY

**WAKEFIELD, PINDERFIELDS GENERAL HOSPITAL**

**HOUSE PHYSICIAN**

(Pre-registration or Senior House Officer according to experience) required for the Neurological Department, which is closely associated with the Teaching Hospital at Leeds. Written applications, giving full personal particulars, details of experience and two names and addresses for reference to be addressed to W. Bowring, Group Secretary, Victoria Chambers, Wood Street, Wakefield. (8397)

## NEUROSURGERY

**THE UNITED LEEDS HOSPITALS**

**The General Infirmary at Leeds**

**SENIOR HOUSE OFFICER IN NEUROSURGERY**

required for a period of six months from November 1, 1956. The appointment will be renewable for a further period of six months. Terms and conditions of service for hospital medical staffs apply. Applications, giving details of age, qualifications, posts held (with dates), and with three names for reference, should be sent to the Secretary to the Board as soon as possible. (8079)

## OBSTETRICS AND GYNAECOLOGY

**N.E. METROPOLITAN REGIONAL HOSPITAL BOARD**

**OBSTETRIC REGISTRAR (Resident)**
**Thorpe Coombe Maternity Hospital, Forest Road, E.17**

Recognized for M.R.C.O.G.

**REGISTRAR IN OBSTETRICS AND GYNAECOLOGY (Non-resident)**
**Prince of Wales's General Hospital, Tottenham, N.15, and Bearstead Memorial Hospital**

Recognized at the Prince of Wales's General Hospital for D.R.C.O.G. and M.R.C.O.G.

Appointments subject to review after one year. Application forms from Secretary, 11, Portland Place, W.1, to be returned by October 6. (8309)

**SHEFFIELD REGIONAL HOSPITAL BOARD**

**Victoria Hospital, Mansfield (302 beds)**
**King's Mill Hospital, Sutton-in-Ashfield (172 beds)**
**(Recognized jointly for D.Obst.R.C.O.G.)**

**WHOLE-TIME RESIDENT REGISTRAR**
**(Obstetrics and Gynaecology)**

required. Married accommodation available at Victoria Hospital. Appointment for one year in first instance. Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, by October 1, 1956, giving age, nationality, qualifications, present and previous appointments (with dates), naming three referees. (8232)

**WELSH REGIONAL HOSPITAL BOARD**

**REGISTRAR OBSTETRICS AND GYNAECOLOGY**

St. Asaph General and Maternity Hospital (201 beds). Post recognized for M.R.C.O.G. examination. Self-contained flat available. Post vacant immediately. Subject to review end of first year. Application forms from S.A.M.O., Temple of Peace, Cathays Park, Cardiff, within fourteen days. (8296)

**NORTHERN REGIONAL HOSPITAL BOARD (Scotland)**

Applications are invited for the whole-time post of

**JUNIOR HOSPITAL MEDICAL OFFICER**

at the Ross Memorial Hospital, Dingwall. Applicants should have previous experience in obstetrics in hospital or general practice. The post is resident and a suitable house is available. Schedules of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by October 15, 1956.—A. M. Fraser, M.D., Secretary and Administrative Medical Officer, Office of the Northern Regional Hospital Board, Raigmore, Inverness. (8367)

**DULWICH HOSPITAL**
**(in association with King's College Hospital Medical School for teaching purposes), East Dulwich Grove, London, S.E.22**

Applications invited for appointment as

**SENIOR HOUSE OFFICER**
**(Obstetrics and Gynaecology)**

Post vacant November 1. Recognized for M.R.C.O.G. Apply, giving age, qualifications and experience, with copy testimonials, or names of two referees, to Group Secretary, Camberwell H.M.C., Dulwich Hospital, S.E.22, not later than October 5. (8248)

**CAERNARVON AND ANGLESEY HOSPITAL MANAGEMENT COMMITTEE**

**St. David's Hospital, Bangor (136 beds and cots) (Specialist Hospital for Obstetrics, Gynaecology and Paediatrics)**
**Part I Midwifery Training School**

Applications are invited for the post of

**RESIDENT SENIOR HOUSE OFFICER**

in the Gynaecological and Obstetrical Department of the above Hospital. Previous experience in obstetrics is essential. In the first instance the post will be in gynaecology—there will be opportunity for transfer to the obstetrical department at the end of six months. The post is recognized by the Royal College of Gynaecologists and Obstetricians for the Membership examination. Salary according to scale. Post vacant October 1, 1956. Applications, stating age, qualifications and experience, together with copies of three recent testimonials, to be forwarded to the Group Secretary, Plas Gwyn, Friddoedd Road, Bangor, within ten days of the appearance of this advertisement. (8360)

**GLANTAWE HOSPITAL MANAGEMENT COMMITTEE**

**Swansea Hospital (403 beds), Swansea**

Registered medical practitioners are invited to apply for the resident appointment of

**SENIOR HOUSE OFFICER**

in the Gynaecological Department of the above hospital. Vacancy November 1, 1956. Applications, stating age and experience, together with copies of two recent testimonials, should be addressed to the Hospital Secretary. (8272)

**ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE**

**Birch Hill Hospital**

**SENIOR HOUSE OFFICER**
**(Obstetrics and Gynaecology)**

required mid-September. The post is for twelve months in the first instance and is recognized for the D.R.C.O.G. Apply at once to the Group Secretary, Central Offices, Birch Hill Hospital, Rochdale. (8053)

**STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE**

**City General Hospital (845 beds)**
**(100 Maternity, 40 Gynaecological)**

**SENIOR HOUSE OFFICER or HOUSE OFFICER**
**(Obstetrics and Gynaecology)**

required. Post vacant early November. Recognized M.R.C.O.G. and D.R.C.O.G. Applications to H.M.C. Secretary, Princes Road, Stoke-on-Trent, as soon as possible. (8233)

**EAST END MATERNITY HOSPITAL**
**384/398, Commercial Road, London, E.1**
**(58 beds)**

Applications are invited for the following posts which are recognized for the M.R.C.O.G.

**RESIDENT SENIOR OBSTETRICAL OFFICER**
**(Senior House Officer grade)**
**RESIDENT OBSTETRICAL OFFICER**
**(House Officer 3rd post)**

Posts vacant November 1, 1956. Applications, with copies of testimonials, to the Secretary, Stepney Group Hospital Management Committee, Raine Street, Wapping, E.1, by September 24, 1956. (8119)

**CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE**

**Cheltenham Maternity Hospital**

Applications are invited from registered medical practitioners for the appointment of

**RESIDENT OBSTETRIC OFFICER**

The hospital, which is recognized for the purpose of training for the D.R.C.O.G., has 50 beds, and deals with the majority of abnormal midwifery cases in North-East Gloucestershire. The appointment is for a period of six months and the salary will be £425, £475, or £525 per annum, less £125 in respect of residential emoluments. The appointment will be vacant on October 20, 1956. Applications, stating age, qualifications, and experience, and accompanied by copies of three recent testimonials, should be sent to the Secretary, Cheltenham Group Hospital Management Committee, General Hospital, Cheltenham. (8326)

**BIRMINGHAM, 13, SORRENTO MATERNITY HOSPITAL, Wake Green Road**
**(106 beds, including 24 premature baby cots)**

**OBSTETRIC HOUSE SURGEON**

Recognized for D.Obst.R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Vacant November 1. Apply Obstetrician by September 26. (7939)

**HERTS AND ESSEX GENERAL HOSPITAL**
**Bishop's Stortford, Herts (400 beds)**
**(Midway between London and Cambridge. Main Line Railway from Liverpool Street)**

**HOUSE OFFICER (Obstetrics, etc.)**

(male or female), first, second, or third post held, to commence November 1, 1956, for a period of six months. Duties in connection with Obstetric Department, Neonatal Nursery and Paediatric Ward of 24 beds. Salary £425 to £525 per annum, less £125 in respect of resident facilities. Applications, stating qualifications, nationality, age and experience, with copies of testimonials or names of two referees, should be sent to the Hospital Secretary. (8298)

**UNITED BIRMINGHAM HOSPITALS**

**Birmingham and Midland Hospital for Women, Showell Green Lane, Sparkhill, Birmingham, 11**

Applications are invited from registered medical practitioners for the post of

**RESIDENT GYNAECOLOGICAL HOUSE SURGEON**

for duty with the Professorial Unit from December 1, 1956. The appointment is recognized for the M.R.C.O.G. and D.R.C.O.G. Application forms, obtainable from the House Governor at the above address, to be returned not later than October 6, 1956.—G. A. Phalp, Secretary. (8302)

**WATFORD MATERNITY HOSPITAL**
**King Street, Watford (58 beds)**

Applications are invited for the resident post of

**JUNIOR OBSTETRIC OFFICER**

for duties commencing November 4, salary £425 to £525 per annum, according to experience, less £125 per annum for residential emoluments. Hospital recognized for M.R.C.O.G. examination. Applications, giving full details of age, nationality, qualifications, present and previous appointments, with dates, and copies of three testimonials, should be sent to the Hospital Secretary. (8370)

**WINDSOR, KING EDWARD VII HOSPITAL**

**OBSTETRIC AND GYNAECOLOGICAL HOUSE SURGEON**

required, male or female, for post vacant October 1. Post recognized for M.R.C.O.G. and D.R.C.O.G. Not a pre-registration post. Successful candidate will be resident at the Old Windsor Unit of this Hospital. Applicants required to be members of a Medical Protection Society. Applications, stating age, nationality, qualifications, with dates, with copies of recent testimonials, or names of three referees, to Hospital Secretary as soon as possible. (7962)

**NORTH MIDDLESEX HOSPITAL**
**Edmonton, N.18**

**TWO OBSTETRIC AND GYNAECOLOGICAL HOUSE SURGEONS**

resident, required for November 1, 1956: (a) Registered medical practitioner, (b) pre-registration candidate (second post). Both posts recognized by R.C.O.G. for Diploma, and as a combined post for Membership. Candidates must have held house appointments in either medicine or surgery. Large obstetric and gynaecological department. Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital by October 2. (8353)

**WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE**

**OBSTETRICAL HOUSE OFFICER**

British Hospital for Mothers and Babies, Samuel Street, Woolwich. Recognized for D.Obst. & M.R.C.O.G. Approved for pre-registration service. Vacant November 1, 1956.

**HOUSE SURGEON (Gynaecology & Obstetrics)**

Memorial Hospital, Shooters Hill, Woolwich. Recognized for M.R.C.O.G. (six months Gynaecology). Small Obstetric Unit providing good experience. Vacant early November.

Applications to Group Secretary, Memorial Hospital, Woolwich, S.E.18. (8341)

**SHREWSBURY HOSPITAL GROUP**

**Cross Houses Hospital (34 maternity beds)**

**OBSTETRIC HOUSE SURGEON**

Pre-registration post. Vacant immediately. Applications, with copy testimonials, to Group Secretary, Royal Salop Infirmary, Shrewsbury. (Pr.7941)

## Obstetrics and Gynaecology—contd.

### LEEDS REGIONAL HOSPITAL BOARD

**RECOGNIZED PRE-REGISTRATION HOUSE OFFICER POSTS**

will be available for the six months commencing November 1, 1956, in the following hospitals approved under the Medical Act, 1950:

Pinderfields General Hospital, Wakefield (663 beds) House Officer (Gynaecology)

Staincliffe General Hospital, Dewsbury (311 beds) House Officer (Obstetrics and Gynaecology)

*Huddersfield Royal Infirmary (305 beds) House Officer (Obstetrics and Gynaecology)

*Princess Royal Maternity Home, Huddersfield (57 beds) House Officer (Obstetrics).

Keighley Victoria Hospital (144 beds) House Officer (Obstetrics and Gynaecology) (Vacant now)

*St. James's Hospital, Leeds (1,539 beds) House Officer (Gynaecology)

*St. Mary's Hospital, Leeds (216 beds) House Officer (Obstetrics)

*Recognized by R.C.O.G.

Application forms obtained from Senior Administrative Medical Officer, Park Parade, Harrogate, or from the Dean, School of Medicine, Thoresby Place, Leeds, 2. (Pr.7963)

## OPHTHALMOLOGY

### BIRMINGHAM REGIONAL HOSPITAL BOARD

**WHOLE-TIME SENIOR REGISTRAR IN OPHTHALMOLOGY**

Duties at North Staffordshire Royal Infirmary (455 beds). Higher qualification/wide experience specialty essential. Resident or non-resident (three miles radius of hospital). Successful candidate may subsequently be required to spend not more than two years in a selected hospital of the United Birmingham Hospitals in accordance with the arrangements for the interchange of Registrars agreed between the two Boards. Fifteen copies application, naming three referees, to Secretary, R.H.B., 10, Augustus Road, Birmingham, 15, before October 8, 1956. Candidates may visit Hospital. (8273)

### COVENTRY AND WARWICKSHIRE HOSPITAL (354 beds)

**J.H.M.O. IN OPHTHALMOLOGY**

Resident. Recognized D.O. and F.R.C.S. (Ophthalmology). Excellent experience in both in- and out-patient work. Vacant November 8. Experience specialty desirable. Apply Hospital Secretary. (8212)

### ROYAL EYE HOSPITAL
**St. George's Circus, S.E.1**
**(King's College Hospital Group)**

Applications are invited for the appointment of

**SENIOR HOUSE OFFICER (Resident)**

with casualty duties. The appointment will be from October 1, 1956, for six months in the first instance, but will be subject to reappointment. Applications, stating age, education, qualifications and experience, with the names of two referees, should be sent to the undersigned by September 29.—S. W. Barnes, House Governor, King's College Hospital, Denmark Hill, S.E.5. (8362)

### BANGOUR GENERAL HOSPITAL, West Lothian (15 miles from Edinburgh)

Applications are invited for the appointment of

**SENIOR HOUSE OFFICER**

in the Ophthalmic Unit (32 beds) at Bangour General Hospital, Broxburn, which is associated with the Ophthalmic Unit of the Royal Infirmary, Edinburgh. Salary and conditions of service will be in accordance with the regulations. Applications, giving age, qualifications and particulars of previous experience, should be lodged with the Group Secretary and Treasurer, Board of Management, Bangour Hospital, Broxburn, West Lothian. (8366)

### THE UNITED LIVERPOOL HOSPITALS

**St. Paul's Eye Hospital**

Applications are invited for a post of

**SENIOR HOUSE OFFICER in Ophthalmology**

for the period to September 30, 1957. Apply as soon as possible, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney Street, Liverpool, 1. (8322)

### WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY

**SENIOR HOUSE OFFICER**

required for October. 100 beds and busy Out-patient Department. Recognized for F.R.C.S. and D.O.M.S. examinations. Applications to Secretary, Eye Infirmary, Compton Road, Wolverhampton. (8371)

## ORTHOPAEDICS

### ALTON, HANTS, LORD MAYOR TRELOAR ORTHOPAEDIC HOSPITAL
**(340 beds—Adults and Children)**

**SENIOR ORTHOPAEDIC REGISTRAR**

wanted, whole-time, resident. Post available for one year and is approved by the British Postgraduate Medical Federation to give Senior Orthopaedic Registrars an opportunity of spending one year in an active Orthopaedic Hospital with many long-stay orthopaedic patients. Attendance necessary at peripheral clinics. Quarters for a single man, unfurnished three-bedroom house for married man. Canvassing disqualifies but visit to hospital (by appointment) welcomed. Application form from Secretary. (8071)

### ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE

**Chase Farm Hospital, Enfield, Middlesex**

**TEMPORARY REGISTRAR IN ORTHOPAEDICS AND GENERAL SURGERY**

required for General Surgical duties. Non-resident. Appointment vacant October 8, 1956. Duration one month. Applications, with names and addresses of two referees, to the Group Secretary at Chase Farm Hospital, by September 28, 1956. (8286)

### SOUTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD

Applications are invited for an appointment as whole-time

**REGISTRAR in Orthopaedic Surgery**

to fill a vacancy in the approved trainee establishment in the Brighton and Lewes group of hospitals. The appointment will be in accordance with the Terms and Conditions of Service of Hospital Medical and Dental Staff (England and Wales), and will be for one year in the first instance. Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of two referees to be sent to the Secretary, Registrars Committee, South-East Metropolitan Regional Hospital Board, 11, Portland Place, W.1, not later than October 6, 1956. (8234)

### SOUTH-WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE

**REGISTRAR ORTHOPAEDIC SURGEON**

whole-time, at General Hospital, Bishop Auckland (300 beds), 51-bed orthopaedic unit. Married or single accommodation available. Applications, with names and addresses of three referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield Road, Newcastle-upon-Tyne, 6. (8249)

### BURTON-UPON-TRENT GENERAL HOSPITAL

**J.H.M.O. (Orthopaedic)**

required. Duties include supervision of Casualty House Officer. Applications to Group Secretary. (8337)

### BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE

**The Royal Infirmary, Bolton (237 beds)**

**RESIDENT SENIOR HOUSE OFFICER IN ORTHOPAEDIC SURGERY**

Vacant October 29, tenable for twelve months and recognized for F.R.C.S. Applications, with the names of two referees, to Group Secretary, The Royal Infirmary, Bolton. (8250)

### BRISTOL, WINFORD ORTHOPAEDIC HOSPITAL (230 beds)

**SENIOR HOUSE OFFICER**

Applications are invited from registered medical practitioners for this post. Vacant immediately. Suitable for candidate reading for higher grade qualifications and recognized for F.R.C.S. Hospital is staffed by consultants of teaching hospitals. Apply stating age, qualifications and experience, with testimonials, to Secretary. (8032)

### CARDIFF (near), PRINCE OF WALES ORTHOPAEDIC HOSPITAL, Rhydlafar

**SENIOR HOUSE OFFICER**

required. Regional Orthopaedic Centre for South Wales area of 220 beds increasing to 290 and branch of 70 beds. Out-patients clinic in Cardiff. Single accommodation at hospital at Rhydlafar. Form of application from the Group Secretary, 44, Cathedral Road, Cardiff. (8265)

### MANSFIELD (near), NOTTS, HARLOW WOOD ORTHOPAEDIC HOSPITAL (338 beds)

Applications are invited from Registered Medical Practitioners for the post of

**RESIDENT SENIOR HOUSE OFFICER**

which will be vacant on October 1, 1956. The Hospital deals not only with long-term orthopaedic but also with all other types of cases, including traumatic work. The post is recognized for examination purposes by the Royal College of Surgeons. Applications to Group Secretary, Nottingham No. 5 H.M.C., Ransom Sanatorium, Rainworth, near Mansfield. (8093)

### NEWMARKET GENERAL HOSPITAL, Suffolk

Applications are invited for the post, now vacant, of

**SENIOR HOUSE OFFICER**

for Orthopaedic and Casualty duties. The post is resident and applications, giving age, nationality and qualifications, together with three recent testimonials, should be sent to the Medical Superintendent. (7776)

### OLDHAM ROYAL INFIRMARY

**APPOINTMENT OF SENIOR HOUSE OFFICER**
**(Orthopaedics) (Resident)**

Applications are invited for the appointment of Senior House Officer in the Fracture and Orthopaedic Service at the above Hospital. (Recognized for F.R.C.S.) Applications should be forwarded to the Group Secretary, Oldham and District Hospital Management Committee, Central Offices, Rochdale Road, Oldham. (8300)

### OSWESTRY, THE ROBERT JONES AND AGNES HUNT ORTHOPAEDIC HOSPITAL

**SENIOR HOUSE OFFICER**

Two vacancies. Resident. Apply Secretary. (8372)

### PLYMOUTH, MOUNT GOLD HOSPITAL

**SENIOR HOUSE OFFICER**

for the Orthopaedic and Fracture Service centring on Mount Gold Orthopaedic (with annexe 122 beds) and associated Hospitals. Post recognized by R.C.S. Married accommodation available. Applications, stating age, qualifications (with dates, etc.), and with copies of two recent testimonials, to be forwarded to the Secretary within 14 days of this advertisement appearing. (8330)

### TILBURY & SOUTH-EAST ESSEX HOSPITAL MANAGEMENT COMMITTEE

**Tilbury & Riverside General Hospital**
**Orsett Branch, Orsett, Essex**

**SENIOR HOUSE OFFICER**

Applications are invited for the above post, which offers experience of all forms of Orthopaedic, Accident and Casualty work. There are 65 Orthopaedic beds at the Hospital. The post, which is recognized by the Royal College of Surgeons, will be for six months in the first instance. Applications, together with copies of not more than three recent testimonials, should be forwarded to the undersigned.—G. E. Whyte, Group Secretary, Thurrock Hospital, Grays, Essex. (7942)

### WIGAN, ROYAL ALBERT EDWARD INFIRMARY (200 beds)

**SENIOR HOUSE OFFICER IN ORTHOPAEDIC SURGERY**

Post vacant November 1. Applications to Secretary. (8024)

### WORKSOP, NOTTS, VICTORIA HOSPITAL

**SENIOR HOUSE OFFICER**
**(Orthopaedics and Casualty Department)**

Applications are invited for this appointment, which is vacant now. Inquiries and applications, with names and addresses of two referees, to be sent to Group Secretary. (8274)

### BEDFORD GENERAL HOSPITAL (439 beds)

**HOUSE SURGEON**

required (mainly Orthopaedic). Pre- or post-registration; recognized for F.R.C.S. Vacant mid-October. Post offers exceptional opportunities for general experience in busy acute surgical units. Inquiries and applications, with copies two recent testimonials, to Group Secretary, 3, Kimbolton Road, Bedford. (7928)

### NORTHAMPTON GENERAL HOSPITAL (482 beds)

Vacancy October 1, 1956, for

**FRACTURE AND ORTHOPAEDIC HOUSE OFFICER**

Recognized for F.R.C.S. and for pre-registration. Six months' appointment in first instance. Applications, as soon as possible, to S. G. Hill, Superintendent. (Pr.7152)

### NUNEATON, MANOR HOSPITAL (125 beds)

**HOUSE OFFICER**
**Orthopaedic and General Surgery**

(Pre-registration) (60 beds). Resident. Applications to Hospital Secretary. (Pr.7929)

**IMPORTANT: All intending applicants should read the revised NOTICE at the top of page 28**

## Orthopaedics—contd.

**SOUTHAMPTON, ROYAL SOUTH HANTS HOSPITAL (278 beds)**

**ORTHOPAEDIC HOUSE SURGEON**

required. Post recognized for pre-registration service and tenable for 6 months. The Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopaedic conditions are also drawn from a wide area. Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Buffar Street, Southampton. (Pr.6442)

**STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE**

**Ashford Hospital, Ashford, Middlesex**

**RESIDENT HOUSE SURGEON (Male)**

required for Traumatic and Orthopaedic Unit on November 1, 1956. Six months' appointment suitable for pre-registration candidates. Applications, stating age, qualifications and experience, with copies of up to three recent testimonials, to Medical Director of Hospital. (Pr.8382)

## PAEDIATRICS

**THE HOSPITAL FOR SICK CHILDREN**
**Great Ormond Street, London, W.C.1**

There is a vacancy for a non-resident

**SURGICAL OUT-PATIENT ASSISTANT**

(Grade—Senior Registrar), attending on Saturday mornings. Full particulars and form of application, which must be returned not later than October 22, 1956, are obtainable from the undersigned.—H. F. Rutherford, House Governor and Secretary. (8282)

**THE BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD**

Applications are invited by the above Boards for the joint appointment of

**REGISTRAR IN PAEDIATRICS**

This post becomes vacant on December 6, 1956. The appointment, which is resident, will be held for one year in the first instance and be renewable for a further year. The successful candidate will be appointed to work for the first year at Southmead Hospital, Bristol, which is associated with the University Departments of Child Health and Obstetrics. The post offers excellent experience in general paediatrics, neonatal paediatrics, and care of the premature baby. Applications, stating date of birth, qualifications and experience, together with the names and addresses of two referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park Road, Bristol, 8, not later than September 29, 1956. (8401)

**QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE**
**Hackney Road, E.2, Shadwell, E.1, and Banstead Wood, Surrey**

**RESIDENT MEDICAL OFFICER**
**(male or female) Graded Senior House Officer at Banstead**

Applications are invited for the above appointment, vacant now. Candidates must have had experience in the treatment of sick children. The appointment will be for six months or one year. Application forms may be obtained from the Secretary at Hackney Road, and should be returned, with copies of not more than three testimonials, as soon as possible. (8022)

**WARRINGTON GENERAL HOSPITAL (344 beds)**

**SENIOR HOUSE OFFICER (Paediatrics)**
**(Male or Female)**

Applications are invited for the above post, which will become vacant on December 1, 1956. (Post recognized for D.C.H.) Scale of salary £745 per annum, less £150 for residential emoluments. Applications to be forwarded to: H. L. Boot, Group Secretary, Warrington & District Hospital Management Committee, c/o General Hospital, Warrington, Lancs. (8331)

**CHILDREN'S HOSPITAL, Sydenham, S.E.26**

**HOUSE OFFICER (Medicine and Surgery)**

required October 29. Recognized for D.C.H. Apply, naming two referees, to Administrative Officer by September 25. (8122)

**EVELINA CHILDREN'S HOSPITAL OF GUY'S HOSPITAL**
**Southwark Bridge Road, London, S.E.1**

**RESIDENT HOUSE PHYSICIAN**
**(with Casualty Duties)**

for six months from November 1, 1956. Appointment recognized for the D.C.H. Candidates must be registered practitioners and should apply, giving age, nationality, qualifications (with dates), and copies of three recent testimonials, to the Hospital Secretary by October 4, 1956. (8355)

**EDGWARE GENERAL HOSPITAL**
**Edgware, Middlesex**

**RESIDENT PAEDIATRIC HOUSE PHYSICIAN**

Post vacant November 19, 1956. Six months' appointment. Applications, stating age, qualifications, experience and enclosing copies of up to three recent testimonials, to Medical Director of Hospital, by October 6, 1956. (8319)

**THE UNITED SHEFFIELD HOSPITALS**

**Children's Hospital**

Applications are invited from Registered Medical Practitioners for the resident post of

**HOUSE PHYSICIAN**

to the professorial unit at the above Hospital, vacant on November 1, 1956 (six months). Applications, stating age, qualifications and experience, with the names of three referees, should reach the Superintendent, The Children's Hospital, Western Bank, Sheffield, not later than September 26, 1956. (8157)

## PATHOLOGY

**MANCHESTER REGIONAL HOSPITAL BOARD**

**WHOLE-TIME CONSULTANT GROUP PATHOLOGIST**

North and Mid-Cheshire Group of Hospitals, mainly at Altrincham General Hospital, near Manchester. Existing laboratory being improved and extended. Good training and experience in all branches of hospital pathology essential. Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood Road, Manchester, 8, to be returned by October 3, 1956. (8292)

**BERNHARD BARON MEMORIAL RESEARCH LABORATORIES**
**Queen Charlotte's Maternity Hospital**

**A REGISTRAR IN PATHOLOGY**

is required at the above laboratories. Previous specialized experience is not essential. The successful candidate will have opportunities to work in all departments, will receive special training in serology and later may assist in research work. The post is resident. Applications to the House Governor at the Hospital, on forms obtainable from 339, Goldhawk Road, London, W.6, within fourteen days of this advertisement. (8417)

**LONDON CHEST HOSPITAL**

**Hospitals for Diseases of the Chest**

A vacancy occurs January 1, 1957, for:

**REGISTRAR IN CLINICAL PATHOLOGY**
**(Registrar Grade)**

The appointment (non-resident) is a whole-time one and will be for one year in the first instance. Applications, stating date of birth, qualifications (with dates) and previous experience, together with copies of three testimonials, should reach the undersigned not later than October 15, 1956.—Thomas Brown, House Governor, London Chest Hospital, E.2. (8330)

**NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD**

**WHOLE-TIME, RESIDENT, PATHOLOGICAL REGISTRAR**

required, one year in first instance, Central Middlesex Hospital, N.W.10, to act as Transfusion Officer, assist the consultant haematologist and take part in the 24-hour pathological service. Post vacant October 15. Hospital may be visited by direct appointment. Application forms from, and returnable to, Group Secretary, Central Middlesex Group H.M.C., Acton Lane, N.W.10, by October 6, 1956. (8311)

**ST. ANN'S GENERAL HOSPITAL**
**Tottenham, N.15**

**REGISTRAR IN PATHOLOGY (Resident)**

Appointment subject to review after one year. Application forms from Secretary, N.E. Metropolitan Regional Hospital Board, 11a, Portland Place, W.1, to be returned by October 6. (8310)

**NEWCASTLE REGIONAL HOSPITAL BOARD**

**North-West Durham Hospital Management Committee**

**REGISTRAR PATHOLOGIST**

whole-time, resident. Single accommodation available. Appointment commences January 1, 1957. Applications, with names and addresses of three referees, to Senior Administrative Medical Officer, Benfield Road, Newcastle-upon-Tyne, 6, within fourteen days. (8251)

**STOKE-ON-TRENT GROUP**

**REGISTRAR, Pathology**

for City General Hospital (845 beds). Resident. Laboratory recognized for Dip.Path. Excellent experience in specialty available. Library facilities. Application forms from H.M.C. Secretary, Princes Road, Stoke-on-Trent, to be returned by October 1, 1956. Candidates may visit hospital. (8266)

**COVENTRY AND WARWICKSHIRE HOSPITAL (354 beds)**

**ASSISTANT PATHOLOGIST (J.H.M.O. Status)**

for duties mainly at Group Laboratory. Recognized D.Path. Good opportunity for experience in all branches of specialty. Applications, giving full details and names of two referees, to Secretary, Group 20 H.M.C., Stoney Stanton Road, Coventry. (8213)

**BRISTOL—SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE**

Required immediately at Southmead Hospital (571 beds, including 133 maternity)

**RESIDENT SENIOR HOUSE OFFICER**
**(Pathology)**

General experience in clinical pathology, including Blood Transfusion duties. (There is a possibility of a further year's appointment with basic training in Morbid Anatomy.) Applications to be submitted to the Group Secretary, Southmead Hospital, Bristol. (8767)

**PRESTON AND CHORLEY HOSPITAL MANAGEMENT COMMITTEE**

**Preston Royal Infirmary (400 beds)**

**SENIOR HOUSE OFFICER (Pathology)**

for Group Laboratory, vacant immediately. Applications, with names of two referees, to Group Secretary, Royal Infirmary, Preston. (8237)

**READING AREA HOSPITALS**

Applications are invited for the post of

**SENIOR HOUSE OFFICER (Pathology)**

Previous experience in pathology desirable, but not essential. Salary £745 (less £150 board residence). Apply, stating age, qualifications with dates, nationality, present post, together with the names of three referees, to Group Secretary, 3, Craven Road, Reading. (8090)

**SHEFFIELD, CITY GENERAL HOSPITAL**
**Department of Pathology Group Laboratory**

**SENIOR HOUSE OFFICER**
**Clinical Pathology**

Applications are invited for the above appointment. Resident accommodation is available and optional. Opportunities for training in morbid anatomy, biochemistry, haematology, and bacteriology. The work of this and the associated hospitals offers excellent experience to graduates who wish to make pathology their permanent career. The post is recognized for the D.Path. Apply, giving details of age, qualifications, present and previous appointments (with dates), and the names of two persons to whom reference may be made, to the Group Secretary at Nether Edge Hospital, Sheffield, 11. (8214)

**THE LEICESTER ROYAL INFIRMARY**

Applications are invited for the posts of

**SENIOR HOUSE OFFICER, Pathology (2)**

vacant October 1. The posts are recognized for D.Path. and D.C.P. Applications, stating age, qualifications and experience, together with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, forthwith. (7683)

**THE UNITED BIRMINGHAM HOSPITALS**

**The Children's Hospital, Ladywood Road, Birmingham, 16**

Applications are invited for the appointment of resident

**SENIOR HOUSE OFFICER**

to work in the Clinical Pathological Department, vacant November 8, 1956, for one year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital. Forms of application may be obtained from the House Governor, and should be returned by October 6, 1956.—G. A. Phaip, Secretary to the Board of Governors. (8333)

## PHYSICAL MEDICINE

**NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD**

**ASSISTANT PHYSICIAN IN PHYSICAL MEDICINE**

two half-days a week, Senior Hospital Medical Officer grade, King Edward Memorial Hospital, Ealing (151 beds). Hospital may be visited by direct appointment. Application forms obtainable from, and returnable to, Secretary, North-West Metropolitan Regional Hospital Board, 11a, Portland Place, W.1, before October 26, 1956. (8312)

**UNIVERSITY COLLEGE HOSPITAL**
**Gower Street, W.C.1**

Applications are invited for the appointment of

**REGISTRAR**

in the Department of Physical Medicine for one year in the first instance. Applications, with names of two referees, to Administrator and Secretary by October 6, 1956 (8318)

## Physical Medicine—contd.

### THE UNITED NEWCASTLE-UPON-TYNE HOSPITALS

Applications are invited for the whole-time, non-resident appointment of

**REGISTRAR**

**to the Department of Physical Medicine**

at the Royal Victoria Infirmary. The appointment is for one year in the first instance and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service. Applications, giving full details and the names and addresses of three referees, should be sent to the undersigned within two weeks of the appearance of this advertisement.—A. W. Sanderson, House Governor and Secretary, Royal Victoria Infirmary, Newcastle-upon-Tyne. (8373)

### THE MIDDLESEX HOSPITAL, W.1

Applications invited for non-resident posts of **REGISTRAR and of SENIOR HOUSE OFFICER** in the Department of Physical Medicine and Rheumatism. Rules and application forms obtainable from Deputy Superintendent, should be returned, naming two referees, by October 6. (8303)

## PLASTIC SURGERY

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**Salisbury Group Hospital Management Committee**
**Regional Plastic and Oral Surgery Centre, Odstock Hospital, Salisbury, Wilts**

Applications are invited for the post of

**SURGICAL REGISTRAR**

Candidates should have had wide surgical experience, and the possession of a higher surgical degree will be an advantage. Post vacant November 16, 1956. Application forms may be obtained from, and must be returned to, the Group Secretary, Odstock Hospital, Salisbury. (8267)

## PSYCHIATRY

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**WHOLE-TIME CONSULTANT PSYCHIATRIST** required at Springfield Hospital, S.W.17 (2,000 beds, including male and female neurosis units). The appointment includes both intramural and extramural duties. Candidates should have D.P.M., and a higher medical qualification and have had extensive experience in all branches of psychiatry. Resident quarters available for a single person. Applications, by letter (five copies), giving date of birth, qualifications, experience, three referees, to Secretary (S.1), S.W. Met. R.H.B., 11a, Portland Place, W.1, by October 20, 1956. Applicants may visit hospital by local arrangement. (8252)

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**WHOLE-TIME CONSULTANT PSYCHIATRIST** required at Long Grove Hospital, Epsom, Surrey. Candidates should possess D.P.M. and a higher medical qualification. Wide experience of psychiatry essential, with special emphasis on modern mental hospital practice, out-patient work, and social psychiatry. Applications, by letter (five copies), giving date of birth, qualifications, experience, three referees, to Secretary, (S.1), S.W.Met.R.H.B., 11a, Portland Place, W.1, by October 20, 1956. Applicants may visit hospital by local arrangement. (8278)

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**WHOLE-TIME PHYSICIAN SUPERINTENDENT AND CONSULTANT PSYCHIATRIST** required at Warlingham Park Hospital, Surrey. Candidates should possess D.P.M. and a higher medical qualification, and should have wide experience in Psychiatry and a knowledge of medical administration. A house is available. Applications, by letter (five copies), giving date of birth, qualifications, experience, three referees, to Secretary (S.1), S.W.Met.R.H.B., 11a, Portland Place, W.1, by October 20, 1956. Applicants may visit hospital by local arrangement. (8277)

### LEEDS REGIONAL HOSPITAL BOARD

**WHOLE-TIME CONSULTANT PSYCHIATRIST** specializing in Mental Deficiency, required for duties mainly at Westwood Hospital (520 beds) and Ashfield House (50 beds), Bradford, and associated with Stansfield View Hospital, Todmorden (160 beds). Other duties may be required in the Halifax, Bradford (A), (B), and Bingley, Keighley, Skipton and Settle Groups. The person appointed will be Physician Superintendent of the above-named hospitals and will be required to reside in Bradford. The duties include those of Medical Arbiter for the Mental Deficiency Area Admission Bureau, together with advising the Local Health Authorities on clinical aspects of Mental Deficiency as required. Applicants should hold the D.P.M., and have had experience in Mental Deficiency. Applications (twelve copies), stating age, qualifications and details of appointments held, showing dates, with the names and addresses of three referees, to the Secretary, Park Parade, Harrogate, by October 20, 1956. (8276)

### EAST ANGLIAN REGIONAL HOSPITAL BOARD

**ASSISTANT CHILD PSYCHIATRIST**
**(Whole-time)**

in the Cambridge Area. Duties will be predominantly at the Cambridge Child Psychiatric Clinic and branch clinics in the area and by agreement with the Board of Governors will include work in the psychiatric out-patient department of Addenbrooke's Hospital. Wide experience and higher qualifications necessary. Salary scale £1,575 to £2,025. Applications (eight copies), stating age, experience and the names of three referees, to Board's Senior Administrative Medical Officer, 117, Chesterton Road, Cambridge, by October 1, 1956. Candidates invited to visit by arrangement with Consultant Child Psychiatrist, Chesterton Hall, Chesterton Road, Cambridge. (8275)

### NEWCASTLE REGIONAL HOSPITAL BOARD

**APPOINTMENT OF ASSISTANT PSYCHIATRIST (S.H.M.O.)**
**St. George's Hospital, Morpeth (1,256 beds)**
**ASSISTANT PSYCHIATRIST (S.H.M.O.)**

whole-time, resident. Candidates should normally hold a D.P.M., but applications will be considered from candidates with no previous practical experience in psychiatry who hold a higher qualification, have had wide experience in general medicine, including Senior Registrar posts, and intend to obtain a D.P.M. and specialize in psychiatry. Full particulars from Medical Superintendent. Applications, with names and addresses of three referees, to Regional Psychiatrist, Newcastle Regional Hospital Board, Benfield Road, Newcastle-upon-Tyne, 6, within 28 days. (8279)

### SHEFFIELD REGIONAL HOSPITAL BOARD

**WHOLE-TIME SENIOR ASSISTANT PSYCHIATRIST**

required for Saxonda'e Hospital, Radcliffe-on-Trent, Notts. House available. Salary scale £1,575 by £50 to £2,025. Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield. Forms to be returned by October 20, 1956. (8280)

### ST. MARY'S HOSPITAL, Paddington, W.2

Applications are invited for the post of

**PART-TIME REGISTRAR to the Psychiatric Department**

(five notional half-days per week). Previous experience in Psychiatry is necessary; preference will be given to candidates holding the D.P.M. The appointment will be for a first period of 12 months as from a date to be arranged; remuneration at "Registrar" rates. Applications, stating nationality, date of birth, permanent address, qualifications, with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of three referees, should reach Alan Powditch, House Governor, not later than October 10, 1956. (8335)

### NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**Marlborough Day Hospital,**
**38, Marlborough Place, N.W.8**

**PSYCHIATRIC REGISTRAR**

for three sessions per week. Clinic may be visited by direct appointment. Application forms from, and returnable to, Group Secretary, Central Middlesex Group H.M.C., Acton Lane, N.W.10, by October 2, 1956. (8313)

### BIRMINGHAM, HOLLYMOOR HOSPITAL (745 beds)

**REGISTRAR, resident/non-resident**

Experience in investigation, diagnosis and treatment all psychiatric illness. D.P.M. course, Birmingham University. Apply Group Secretary by October 1. Candidates may visit hospital. (8268)

### BROADMOOR INSTITUTION
**Crowthorne, Berks (920 beds)**
**for persons of unsound mind of criminal tendencies**

**SENIOR REGISTRAR**

House or quarters available. Applications, naming three referees, to Medical Superintendent by October 13, 1956. Candidates may visit Hospital by appointment. (8287)

### EAST ANGLIAN REGIONAL HOSPITAL BOARD

**REGISTRAR IN PSYCHIATRY**

East Suffolk Mental Hospitals. St. Clement's Hospital, Ipswich (450 beds), and St. Audry's Hospital, Melton, near Woodbridge (1,100 beds) and associated General Hospital Out-patient clinics. There is a very active out-patient department and Electro-encephalographic Department at St. Clement's Hospital. Both hospitals are recognized for the D.P.M. Unfurnished house available. Candidates are invited to visit the hospitals by direct arrangement with Medical Superintendent, St. Audry's Hospital.

**REGISTRAR IN PSYCHIATRY**

St. Andrew's Hospital, Thorpe, Norwich (1,250 beds). Full range of modern psychiatric treatments and a number of associated general hospital out-patient clinics. Married or single quarters available. Appointment for one year, renewable for second year. Candidates invited to visit hospital by direct arrangement with Medical Superintendent. Applications, stating age, experience, and the names of three referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton Road, Cambridge, by October 1, 1956. (8253)

### LEEDS REGIONAL HOSPITAL BOARD

**REGISTRARS IN PSYCHIATRY**

(i) Clifton Hospital, York (1,100 beds). Resident or Non-resident.

(ii) Stanley Royd Hospital, Wakefield (1,976 beds) If desired, facilities for attending Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments (with dates), together with the names and addresses of three referees, to the Secretary, Joint Registrars Committee, Park Parade, Harrogate, by September 28, 1956. (7970)

### NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**PSYCHIATRIC REGISTRAR**

required at West Middlesex Hospital, Isleworth, Middlesex (1,147 beds—General). Whole-time Non-resident. Recognized D.P.M. (England and R.M.P.A.). Candidates should have special interest in Psychotherapy. Psycho-analysis training an advantage. Candidates may visit Hospital by direct appointment with Medical Director. Application forms obtainable from, and returnable to, Group Secretary, South-West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by September 29, 1956. (8398)

**IMPORTANT: All intending applicants should read the revised NOTICE at the top of page 28**

MEDICAL INSURANCE AGENCY LTD.
Chairman: James Fenton, CBE, MD. General Manager: A. N. Dixon, ACII. Hon. Secretary: Henry Robinson, MD, DL, JP.
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## Psychiatry—contd.

### MANCHESTER REGIONAL HOSPITAL BOARD

**SENIOR REGISTRAR in Psychiatry**

with duties in the Salford Group of Hospitals (Salford Royal and Hope Hospitals) and at Springfield Mental Hospital, Manchester. Application forms, obtainable from the Senior Administrative Medical Officer of the Board, Cheetwood Road, Manchester, 8, should be returned by October 8, 1956. (8291)

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

Applications are invited for appointment as
**PSYCHIATRIC REGISTRAR**
**at Belmont Hospital, Sutton**

which is principally concerned with the treatment of neuroses and the early psychoses. There are ample opportunities for research and the hospital, which is recognized for the D.P.M., takes an active part in teaching in association with teaching hospitals. Candidates may visit the hospital by appointment with the Physician Superintendent. Application forms may be obtained from the Group Secretary, Group Office, Belmont Hospital, Brighton Road, Sutton, Surrey, and completed forms (five copies) should be returned to him within two weeks of the appearance of this advertisement. (8254)

### THE BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD

Applications are invited by the above Boards for the joint appointment of

**SENIOR REGISTRAR in Psychiatry**

to the Plymouth Clinical Area based on Moorhaven Hospital, Ivybridge, South Devon. The appointment will be held for one year in the first instance, but may be renewed thereafter on an annual basis. A flat is available suitable for a married man. A comprehensive mental health service is in operation, and experience can be gained in all branches of in-patient and out-patient work (including Neurology, Mental Deficiency and Child Guidance). The out-patient service is based on the South Devon and East Cornwall Hospital, Plymouth, and the Plymouth Child Guidance Clinic. The 1955 Annual Report, which gives full particulars of the service, can be obtained from the Physician-Superintendent, Moorhaven Hospital. Applications, stating date of birth, qualifications and experience, together with the names and addresses of two referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park Road, Bristol, 8, not later than September 29, 1956. (8402)

*AMENDED ADVERTISEMENT*

### BERKSHIRE MENTAL HOSPITAL MANAGEMENT COMMITTEE

Applications are invited for the appointment of
**JUNIOR HOSPITAL MEDICAL OFFICER**

at Fair Mile Hospital, near Wallingford, Berkshire, a mental hospital of 1,053 beds. The post provides an excellent opportunity for postgraduate training in psychiatry, including out-patient clinic work, and every facility is provided for study for the D.P.M. Suitable accommodation for a married man is available. The appointment is subject to the terms and conditions of service for hospital medical staff, the salary being £775 by £50 to £1,075 per annum. Applications, including details of age, qualifications and experience, together with the names of two referees, should be forwarded to the Medical Superintendent, Fair Mile Hospital, near Wallingford, Berks, within ten days of the appearance of this advertisement. (7972)

### GLOUCESTER, HORTON ROAD AND CONEY HILL HOSPITALS (1,450 beds)

Applications invited for the appointment of a
**JUNIOR HOSPITAL MEDICAL OFFICER**

Hospital serves the North Gloucestershire Clinical area, including Gloucester, Cheltenham, Stroud and Forest of Dean. High admission rate (800). All modern methods of treatment. New units provided for treatment of neurosis and alcoholism. Expanding Out-patient services, long-stay annexes and social clubs. Encouragement and opportunity for study. Salary and conditions Whitley Council. Single accommodation available. Married accommodation a possibility. Applications, with names of three referees, to Superintendent within 14 days (7930)

### NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**Napsbury Mental Hospital, Near St. Albans, Herts**

**JUNIOR HOSPITAL MEDICAL OFFICER**

full-time, required. Three years' tenure. Some experience in psychiatry desirable. Single accommodation available. Apply to Medical Superintendent by October 2, 1956. (8314)

### PORTSMOUTH, ST. JAMES HOSPITAL FOR MENTAL AND NERVOUS DISEASE—GROUP 49—SOUTH-WEST METROPOLITAN REGION

**JUNIOR HOSPITAL MEDICAL OFFICER**

The Hospital is approved as a Psychiatric Teaching Hospital and the post offers excellent experience in the treatment of the neuroses, the psychoneuroses, the maladjusted child, and the problems of delinquency. The Neurological department of the hospital is also recognized by the examining bodies and arrangements are made to enable junior medical staff to fulfil the D.P.M. Regulations regarding Mental Deficiency. Intending candidates may visit the hospital by appointment.

**JUNIOR HOSPITAL MEDICAL OFFICER**
**(Locum Tenens)**

required for a period of approximately six months commencing November 1, 1956.

Applications for either appointment, stating age, experience, qualifications, and the names and addresses of two referees, should be sent to the Physician Superintendent within 14 days of the appearance of this advertisement. (8338)

### WAKEFIELD, STANLEY ROYD HOSPITAL

Applications invited for post of
**JUNIOR HOSPITAL MEDICAL OFFICER**
**in Psychiatry**

Salary scale £775 by £50 to £1,075. Married accommodation may be available. Address written applications, giving full personal particulars, details of training, experience, etc., together with two names and addresses for reference, to W. Bowring, Group Secretary, Victoria Chambers, Wood Street, Wakefield. (8133)

### BRENTWOOD, ESSEX, WARLEY HOSPITAL

**SENIOR HOUSE OFFICER**

required. Hospital situated easy reach of London. Over 2,000 beds offering wide experience of all types of mental disorders (including the neuroses), all modern treatments carried out, including psychosurgery. Teaching by Senior staff, library and facilities for attending Postgraduate Courses. Experience in out-patient clinics. Regular clinical meetings are held. Salary £745 per annum, less £150 for excellent residential amenities if required. Applications, with full details and names of two referees, to Physician Superintendent. (8399)

### DARTFORD HOSPITAL MANAGEMENT COMMITTEE

**SENIOR HOUSE OFFICER**

required at the West Hill Hospital. Main duties in active Psychiatric Observation Unit, with duties in Geriatric wards and some casualty work. Vacant November 7, 1956. The post offers good opportunities for study. The hospital is close to London, with good train and bus services. Applications, with full particulars, to the Group Secretary, The Bow Arrow Hospital, Dartford, Kent. (8255)

### GARLANDS HOSPITAL MANAGEMENT COMMITTEE

**Garlands Hospital, Carlisle (1,060 beds)**

**SENIOR HOUSE OFFICER**

Applications are invited from registered medical practitioners for the post of Senior House Officer at the above mental hospital. Salary £745 per annum. Flat is available, for which a deduction will be made. Appointment is subject to the National Health Service (Superannuation) Regulations and to the Conditions and Terms of Service laid down by the Minister of Health. Applications, stating age, qualifications and experience, and the names of two referees, should be sent to the Medical Superintendent as soon as possible. (8421)

## RADIOLOGY

### THE ROYAL FREE HOSPITAL

**REGISTRAR, X-ray Department**

Applications are invited for the post of Registrar to the X-ray Department of the Royal Free Hospital. The post is non-resident, for one year in the first instance. Duties to commence November 1, 1956. Candidates should be registered medical practitioners of not more than ten years' standing and should hold the D.M.R.(D). Formal applications, giving details of experience, etc., together with three testimonials, should be sent to the Secretary, Royal Free Hospital, Gray's Inn Road, W.C.1, not later than September 30, 1956. (8418)

### EASTERN REGIONAL HOSPITAL BOARD (Scotland)

**Radiodiagnosis**
**Dundee Teaching Hospitals**

Applications are invited for an appointment as
**SENIOR REGISTRAR in Radiodiagnosis**
at Dundee Royal Infirmary (510 beds) and Maryfield Hospital, Dundee (370 beds), both general teaching hospitals associated with the University of St. Andrews. Possession of the Diploma in Radiology is essential. A new Radiodiagnostic Department at Dundee Royal Infirmary has recently been brought into operation. Forms of application and further particulars from the Secretary to the Board, 430, Blackness Road, Dundee, with whom applications must be lodged not later than September 29, 1956. (8044)

## RADIOTHERAPY

### WESTMINSTER HOSPITAL
**St. John's Gardens, S.W.1**

Applications invited for vacant post of
**SENIOR REGISTRAR**

to Radiotherapy Department for one year in first instance. Preference given to candidates holding M.R.C.P., F.R.C.S., or other higher qualification. Successful applicant must take D.M.R.T. during tenure if not already held. Applications (nine copies), with names of two referees, to House Governor by October 6. (8357)

### WESTMINSTER HOSPITAL
**St. John's Gardens, S.W.1**

Applications invited for post of
**REGISTRAR**

to Radiotherapy Department for one year in first instance from October 15, 1956. Preference given to candidates holding F.R.C.S. or M.R.C.P. Experience of general medicine or surgery in Registrar grade an advantage. Knowledge of Radiotherapy not essential. Applications (seven copies), with names of two referees, to House Governor by October 6. (8358)

### SOUTH MANCHESTER H.M.C.

**Christie Hospital and Holt Radium Institute, Manchester, 20**

Applications are invited from registered medical practitioners for the post of
**SENIOR HOUSE OFFICER (Radiotherapy)**
at the above hospital, commencing in October, 1956. Training will be available from April, 1957, for Diploma in Radiotherapy Course. Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately. (8073)

### THE UNITED LEEDS HOSPITALS

**The General Infirmary at Leeds**

**RESIDENT RADIOTHERAPY OFFICER**
**(Senior House Officer Status)**

The appointment is for a period of six months in the first instance, commencing November 1, 1956. The post affords facilities for training for D.M.R.T. Conditions of service for hospital medical staffs apply. Applications, stating age, qualifications, previous posts (with dates), and three names for reference, should be sent to the Secretary to the Board as soon as possible. (8078)

## RHEUMATOLOGY

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**St. Stephen's Hospital, Chelsea, S.W.3**

**MEDICAL REGISTRAR to Rheumatism Unit**

Non-resident. Vacancy November 16, 1956. Post offers wide clinical and research experience both in Rheumatic Diseases and General Medicine. Higher qualification in medicine desirable but not essential. Application forms from Group Secretary, St. Luke's Hospital, Chelsea, S.W.3, to be returned within fourteen days. (Enclose F.S.A.E.) (8390)

## SURGERY

### N.E. METROPOLITAN REGIONAL HOSPITAL BOARD

**GENERAL SURGICAL AND ORTHOPAEDIC REGISTRAR (Resident)**
**Metropolitan Hospital, E.8**
Candidates must possess F.R.C.S.
**SURGICAL REGISTRAR (Resident)**
**Victoria Hospital, Romford, Essex**
**SURGICAL REGISTRAR**
**(Resident or Non-resident)**
**Poplar Hospital, E.14**
**Recognized for F.R.C.S.**

Appointments subject to review after one year. Application forms from Secretary, 11, Portland Place, W.1, to be returned by October 6. (8315)

## Surgery—contd.

### ST. MARK'S HOSPITAL
**City Road, London, E.C.1**

Applications invited from Senior Registrars who have completed their training, or from Registrars who have completed their appointments, for two posts of

**RESIDENT SURGICAL OFFICER**

Part of time non-resident by arrangement. Salary at the rate of £1,400 or £965 respectively. Appointments tenable for six months from December 1 or January 1, with possibility further extension six months. Age, qualifications, experience, names two referees, to Secretary, Board of Governors, The Hammersmith, West London, and St. Mark's Hospitals, Du Cane Road, London, W.12, by October 6. (8316)

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**St. Stephen's Hospital, Chelsea, S.W.10**

**SURGICAL REGISTRAR**

Whole-time. Non-resident. Vacancy November, 1956. Post recognized for F.R.C.S. Application forms obtained from, and returned (within 14 days) to, Group Secretary, St. Luke's Hospital, Sydney Street, S.W.3. (Please enclose F.S.A.E.) (8343)

### HEREFORDSHIRE GROUP

**REGISTRAR IN GENERAL SURGERY**

Duties mainly at General (154 beds—71 surgical beds, including fracture and orthopaedic) and County Hospitals, Hereford (335 beds—40 surgical). Recognized for F.R.C.S. Resident. Application forms from Group Secretary, Victoria House, Eign Street, Hereford, to be returned before October 1, 1956. Candidates may visit hospitals. (8332)

### HERTS AND ESSEX GENERAL HOSPITAL
**(Formerly Haymeads Hospital)**
**Bishop's Stortford**

Applications are invited from Registered Medical Practitioners for the appointment of a whole-time

**TEMPORARY SURGICAL REGISTRAR**

to commence September 27, 1956, for one month in first instance, followed by engagement on a week by week basis. Applications, giving full details, together with copies of recent testimonials, or the names of referees, to the Group Secretary, Hertford H.M.C., County Hospital, Hertford, Herts. (8091)

### LEEDS REGIONAL HOSPITAL BOARD

**REGISTRAR in General Surgery**

Pinderfields General Hospital (70 general surgical beds). Resident, possibility of married accommodation. Recognition of post by the Royal College of Surgeons applied for. Applications, stating age, qualifications and details of present and previous appointments (with dates), together with the names and addresses of three referees, to the Secretary, Joint Registrars Committee, Park Parade, Harrogate, by September 28, 1956. (7974)

### MANCHESTER REGIONAL HOSPITAL BOARD

**Bury and Rossendale Hospital Management Committee**

Applications are invited for

**REGISTRAR IN SURGERY**

at Bury General Hospital. Post recognized for F.R.C.S. Applications, together with the names of two referees, should be sent to H. Wilkinson, Group Secretary, Bury General Hospital, Bury, Lancs. (8301)

### NEWCASTLE REGIONAL HOSPITAL BOARD

**Northallerton Hospital Management Committee**

**REGISTRAR SURGEON**

whole-time, resident, Friarage Hospital (340 beds). Accommodation available. Recognized for F.R.C.S. examination. Applications, with names and addresses of three referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield Road, Newcastle-upon-Tyne, 6, within fourteen days. (8256)

### NORTHERN REGIONAL HOSPITAL BOARD
**(Scotland)**

Applications are invited for the whole-time post of

**SENIOR REGISTRAR in General Surgery**

at the Inverness Group of Hospitals. Main duties are at the Royal Northern Infirmary, Inverness. Schedules of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by October 15, 1956. —A. M. Fraser, M.D., Secretary and Administrative Medical Officer, Office of the Northern Regional Hospital Board, Raigmore, Inverness. (8368)

### NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE

**Crumpsall Hospital**

Applications are invited for the post of

**REGISTRAR IN GENERAL SURGERY (R.S.O.)**

Recognized for F.R.C.S. Vacant October 6, 1956. Applications, with two referees, by October 1, 1956, to Group Secretary, Crumpsall Hospital, Manchester, 8. (8235)

### NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**GENERAL SURGICAL REGISTRAR**

(resident) required at Bedford General Hospital (439 beds). Hospital may be visited by direct appointment. Post vacant October. Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton Road, Bedford as soon as possible. (7698)

### SHEFFIELD REGIONAL HOSPITAL BOARD

**WHOLE-TIME RESIDENT OR NON-RESIDENT SENIOR SURGICAL REGISTRAR**
**(transitional appointment)**

required at City General Hospital, Sheffield, for one year in first instance. The successful candidate to reside at the hospital when "on call." Applications invited from Senior Surgical Registrars in their fourth or subsequent years and from those who held such posts for three years or more but vacated them after January 1, 1951. Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, by October 1, 1956, giving age, nationality, qualifications, present and previous appointments (with dates), naming three referees. (7995)

### THE BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD

**North Gloucestershire Clinical Area**

Applications are invited by the above Boards for the joint appointment of

**REGISTRAR in General Surgery**

The appointment will be held for one year in the first instance, and be renewable for a further year. The successful candidate will be appointed to work for the first year mainly at Cheltenham General, Eye and Children's Hospitals, but may be required to undertake duties in other hospitals in the area. Applications, stating date of birth, qualifications and experience, together with the names and addresses of two referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park Road, Bristol, 8, not later than September 29, 1956. (8403)

### NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE

**Altrincham General Hospital**

**ASSISTANT SENIOR SURGICAL OFFICER**
**(J.H.M.O. Grade)**

Applications are invited for this post in a hospital of 130 acute beds with a busy Casualty Department. The appointee would be required to exercise control of this Department and also to assist R.S.O. with the general surgical work of the hospital. The post offers excellent opportunities of practical experience and postgraduate study to suitably qualified candidates and particularly those studying for higher surgical qualifications. Applications, with names of two referees, to Group Secretary, Sinderland Road, Altrincham. (7931)

### MILDMAY MISSION HOSPITAL
**Austin Street, Bethnal Green, London, E.2**

Applications are invited from registered medical practitioners for the post of

**RESIDENT SENIOR HOUSE OFFICER**

Recognized for the F.R.C.S. Vacant November 1, 1956. The appointment is for one year. Salary £745 per annum, less residential charges. Candidates should be in full sympathy with the evangelistic aims of the hospital. Applications and references to be addressed to the Medical Superintendent. (8348)

### ASHFORD HOSPITAL, Ashford, Kent

Applications are invited for the appointment of

**SENIOR HOUSE SURGEON**

at the above Hospital. The appointment will be tenable for a year. Salary £745 a year, less a deduction of £150 a year for residential emoluments. Applications, stating age, qualifications and the names and addresses of two referees, should be made to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone. (8290)

### BANBURY, OXON, HORTON GENERAL HOSPITAL (163 beds)

**SENIOR HOUSE OFFICER (Surgeon)**

required immediately. Hospital recognized for F.R.C.S. Active surgical department under direction of resident Consultant. Work in general surgical wards, with special responsibility for children. Four other residents. Application, with names of two referees, to the Secretary (6952)

### BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE

**Bolton District General Hospital (604 beds)**

**RESIDENT SENIOR HOUSE OFFICER**

for general surgical duties. Vacant October 31, tenable for twelve months and recognized for F.R.C.S. Applications, with the names of two referees, to Group Secretary, The Royal Infirmary, Bolton. (8257)

### CLACTON AND DISTRICT HOSPITAL
**Clacton-on-Sea (58 beds)**

Applications invited for post of

**SENIOR HOUSE OFFICER**
**(Resident Surgical Officer)**

Post tenable for one year. Applications, with copies of three testimonials, to Group Secretary, Colchester H.M.C., 14, Pope's Lane, Colchester, Essex. (8374)

### COVENTRY AND WARWICKSHIRE HOSPITAL (354 beds)

**SENIOR HOUSE OFFICER**
**in General Surgery**

Vacant November 1. Resident. Recognized F.R.C.S. Apply Hospital Secretary. (8215)

### EPPING, ST. MARGARET'S HOSPITAL
**(480 beds)**

**RESIDENT SENIOR HOUSE OFFICER (Surgery)** as Casualty Officer and Orthopaedic House Surgeon. Post vacant October 1, 1956. Recognized training post for F.R.C.S. Busy General Hospital with easy access to London. Salary on national scale, less deductions for board, lodging, etc. Applications, with copies of two recent testimonials, to the Group Secretary, Epping Group H.M.C., Oak Cottage, The Plain, Epping, Essex. (8009)

### GRIFFITHSTOWN, MON., COUNTY HOSPITAL
**(253 beds—Recognized F.R.C.S.)**

**SENIOR HOUSE OFFICER**

required mid-September. Post covers 35 beds. Recognized F.R.C.S. 6 months, and tenable 6 or 12 months as desired. Salary £745, less £150 board residence. Write, quoting two referees, to T. A. Jones, 64, Cardiff Road, Newport, Mon. (7481)

### GRIMSBY HOSPITAL MANAGEMENT COMMITTEE

**Scartho Road Hospital**

**RESIDENT HOUSE OFFICER (Surgical)**

required (Pre-registration or Senior House Officer Grade), for duties in acute surgical unit of 40 beds, modern theatre and O.P. Department. Offers excellent experience of all types of general surgery. Married quarters available. Applications, with names of two referees, to Hospital Secretary. (8216)

### MARGATE, GENERAL HOSPITAL (132 beds)

**SENIOR HOUSE OFFICER (Surgical)**

Recognized for F.R.C.S. and D.A. Salary £745 per annum, less charge for residential emoluments. Applications, with copies of testimonials, to Hospital Secretary. (7684)

### NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE

**Altrincham General Hospital, Annexe and E.N.T. Department (183 beds)**

**SENIOR HOUSE OFFICER (Surgical)**

This appointment affords excellent experience to suitably qualified candidates. Post recognized under F.R.C.S. regulations. Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland Road, Altrincham, Cheshire. (8236)

### NOTTINGHAM HIGHBURY HOSPITAL

**SENIOR HOUSE OFFICER (Surgical)**

required at the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Duties to commence on or about September 16, 1956. Applications, stating age, qualifications and experience and nationality, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham. (7174)

**IMPORTANT: All intending applicants should read the revised NOTICE at the top of page 28**

## Psychiatry—contd.

**MANCHESTER REGIONAL HOSPITAL BOARD**

**SENIOR REGISTRAR in Psychiatry**

with duties in the Salford Group of Hospitals (Salford Royal and Hope Hospitals) and at Springfield Mental Hospital, Manchester. Application forms, obtainable from the Senior Administrative Medical Officer of the Board, Cheetwood Road, Manchester, 8, should be returned by October 8, 1956. (8291)

**SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD**

Applications are invited for appointment as
**PSYCHIATRIC REGISTRAR**
**at Belmont Hospital, Sutton**

which is principally concerned with the treatment of neuroses and the early psychoses. There are ample opportunities for research and the hospital, which is recognized for the D.P.M., takes an active part in teaching in association with teaching hospitals. Candidates may visit the hospital by appointment with the Physician Superintendent. Application forms may be obtained from the Group Secretary, Group Office, Belmont Hospital, Brighton Road, Sutton, Surrey, and completed forms (five copies) should be returned to him within two weeks of the appearance of this advertisement. (8254)

**THE BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD**

Applications are invited by the above Boards for the joint appointment of

**SENIOR REGISTRAR in Psychiatry**

to the Plymouth Clinical Area based on Moorhaven Hospital, Ivybridge, South Devon. The appointment will be held for one year in the first instance, but may be renewed thereafter on an annual basis. A flat is available suitable for a married man. A comprehensive mental health service is in operation, and experience can be gained in all branches of in-patient and out-patient work (including Neurology, Mental Deficiency and Child Guidance). The out-patient service is based on the South Devon and East Cornwall Hospital, Plymouth, and the Plymouth Child Guidance Clinic. The 1955 Annual Report, which gives full particulars of the service, can be obtained from the Physician-Superintendent, Moorhaven Hospital. Applications, stating date of birth, qualifications and experience, together with the names and addresses of two referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park Road, Bristol, 8, not later than September 29, 1956. (8402)

*AMENDED ADVERTISEMENT*
**BERKSHIRE MENTAL HOSPITAL MANAGEMENT COMMITTEE**

Applications are invited for the appointment of
**JUNIOR HOSPITAL MEDICAL OFFICER**

at Fair Mile Hospital, near Wallingford, Berkshire, a mental hospital of 1,053 beds. The post provides an excellent opportunity for postgraduate training in psychiatry, including out-patient clinic work, and every facility is provided for study for the D.P.M. Suitable accommodation for a married man is available. The appointment is subject to the terms and conditions of service for hospital medical staff, the salary being £775 by £50 to £1,075 per annum. Applications, including details of age, qualifications and experience, together with the names of two referees, should be forwarded to the Medical Superintendent, Fair Mile Hospital, near Wallingford, Berks, within ten days of the appearance of this advertisement. (7972)

**GLOUCESTER, HORTON ROAD AND CONEY HILL HOSPITALS (1,450 beds)**

Applications invited for the appointment of a
**JUNIOR HOSPITAL MEDICAL OFFICER**

Hospital serves the North Gloucestershire Clinical area, including Gloucester, Cheltenham, Stroud and Forest of Dean. High admission rate (800). All modern methods of treatment. New units provided for treatment of neurosis and alcoholism. Expanding Out-patient services, long-stay annexes and social clubs. Encouragement and opportunity for study. Salary and conditions Whitley Council. Single accommodation available. Married accommodation a possibility. Applications, with names of three referees, to Superintendent within 14 days (7930)

**NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD**

**Napsbury Mental Hospital, Near St. Albans, Herts**

**JUNIOR HOSPITAL MEDICAL OFFICER**

full-time, required. Three years' tenure. Some experience in psychiatry desirable. Single accommodation available. Apply to Medical Superintendent by October 2, 1956. (8314)

**PORTSMOUTH, ST. JAMES HOSPITAL FOR MENTAL AND NERVOUS DISEASE—GROUP 49—SOUTH-WEST METROPOLITAN REGION**

**JUNIOR HOSPITAL MEDICAL OFFICER**

The Hospital is approved as a Psychiatric Teaching Hospital and the post offers excellent experience in the treatment of the neuroses, the psychoneuroses, the maladjusted child, and the problems of delinquency. The Neurological department of the hospital is also recognized by the examining bodies and arrangements are made to enable junior medical staff to fulfil the D.P.M. Regulations regarding Mental Deficiency. Intending candidates may visit the hospital by appointment.

**JUNIOR HOSPITAL MEDICAL OFFICER**
**(Locum Tenens)**

required for a period of approximately six months commencing November 1, 1956.

Applications for either appointment, stating age, experience, qualifications, and the names and addresses of two referees, should be sent to the Physician Superintendent within 14 days of the appearance of this advertisement. (8338)

**WAKEFIELD, STANLEY ROYD HOSPITAL**

Applications invited for post of
**JUNIOR HOSPITAL MEDICAL OFFICER**
**in Psychiatry**

Salary scale £775 by £50 to £1,075. Married accommodation may be available. Address written applications, giving full personal particulars, details of training, experience, etc., together with two names and addresses for reference, to W. Bowring, Group Secretary, Victoria Chambers, Wood Street, Wakefield. (8133)

**BRENTWOOD, ESSEX, WARLEY HOSPITAL**

**SENIOR HOUSE OFFICER**

required. Hospital situated easy reach of London. Over 2,000 beds offering wide experience of all types of mental disorders (including the neuroses), all modern treatments carried out, including psychosurgery. Teaching by Senior staff, library and facilities for attending Postgraduate Courses. Experience in out-patient clinics. Regular clinical meetings are held. Salary £745 per annum, less £150 for excellent residential amenities if required. Applications, with full details and names of two referees, to Physician Superintendent. (8399)

**DARTFORD HOSPITAL MANAGEMENT COMMITTEE**

**SENIOR HOUSE OFFICER**

required at the West Hill Hospital. Main duties in active Psychiatric Observation Unit, with duties in Geriatric wards and some casualty work. Vacant November 7, 1956. The post offers good opportunities for study. The hospital is close to London, with good train and bus services. Applications, with full particulars, to the Group Secretary, The Bow Arrow Hospital, Dartford, Kent. (8255)

**GARLANDS HOSPITAL MANAGEMENT COMMITTEE**

**Garlands Hospital, Carlisle (1,060 beds)**

**SENIOR HOUSE OFFICER**

Applications are invited from registered medical practitioners for the post of Senior House Officer at the above mental hospital. Salary £745 per annum. Flat is available, for which a deduction will be made. Appointment is subject to the National Health Service (Superannuation) Regulations and to the Conditions and Terms of Service laid down by the Minister of Health. Applications, stating age, qualifications and experience, and the names of two referees, should be sent to the Medical Superintendent as soon as possible. (8421)

## RADIOLOGY

**THE ROYAL FREE HOSPITAL**

**REGISTRAR, X-ray Department**

Applications are invited for the post of Registrar to the X-ray Department of the Royal Free Hospital. The post is non-resident, for one year in the first instance. Duties to commence November 1, 1956. Candidates should be registered medical practitioners of not more than ten years' standing and should hold the D.M.R.(D). Formal applications, giving details of experience, etc., together with three testimonials, should be sent to the Secretary, Royal Free Hospital, Gray's Inn Road, W.C.1, not later than September 30, 1956. (8418)

**EASTERN REGIONAL HOSPITAL BOARD (Scotland)**

**Radiodiagnosis**
**Dundee Teaching Hospitals**

Applications are invited for an appointment as
**SENIOR REGISTRAR in Radiodiagnosis**

at Dundee Royal Infirmary (510 beds) and Maryfield Hospital, Dundee (370 beds), both general teaching hospitals associated with the University of St. Andrews. Possession of the Diploma in Radiology is essential. A new Radiodiagnostic Department at Dundee Royal Infirmary has recently been brought into operation. Forms of application and further particulars from the Secretary to the Board, 430, Blackness Road, Dundee, with whom applications must be lodged not later than September 29, 1956. (8044)

## RADIOTHERAPY

**WESTMINSTER HOSPITAL**
**St. John's Gardens, S.W.1**

Applications invited for vacant post of
**SENIOR REGISTRAR**

to Radiotherapy Department for one year in first instance. Preference given to candidates holding M.R.C.P., F.R.C.S., or other higher qualification. Successful applicant must take D.M.R.T. during tenure if not already held. Applications (nine copies), with names of two referees, to House Governor by October 6. (8357)

**WESTMINSTER HOSPITAL**
**St. John's Gardens, S.W.1**

Applications invited for post of
**REGISTRAR**

to Radiotherapy Department for one year in first instance from October 15, 1956. Preference given to candidates holding F.R.C.S. or M.R.C.P. Experience of general medicine or surgery in Registrar grade an advantage. Knowledge of Radiotherapy not essential. Applications (seven copies), with names of two referees, to House Governor by October 6. (8358)

**SOUTH MANCHESTER H.M.C.**

**Christie Hospital and Holt Radium Institute, Manchester, 20**

Applications are invited from registered medical practitioners for the post of
**SENIOR HOUSE OFFICER (Radiotherapy)**

at the above hospital, commencing in October, 1956. Training will be available from April, 1957, for Diploma in Radiotherapy Course. Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately. (8073)

**THE UNITED LEEDS HOSPITALS**

**The General Infirmary at Leeds**

**RESIDENT RADIOTHERAPY OFFICER**
**(Senior House Officer Status)**

The appointment is for a period of six months in the first instance, commencing November 1, 1956. The post affords facilities for training for D.M.R.T. Conditions of service for hospital medical staffs apply. Applications, stating age, qualifications, previous posts (with dates), and three names for reference, should be sent to the Secretary to the Board as soon as possible. (8078)

## RHEUMATOLOGY

**SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD**

**St. Stephen's Hospital, Chelsea, S.W.3**

**MEDICAL REGISTRAR to Rheumatism Unit**

Non-resident. Vacancy November 16, 1956. Post offers wide clinical and research experience both in Rheumatic Diseases and General Medicine. Higher qualification in medicine desirable but not essential. Application forms from Group Secretary, St. Luke's Hospital, Chelsea, S.W.3, to be returned within fourteen days. (Enclose F.S.A.E.) (8390)

## SURGERY

**N.E. METROPOLITAN REGIONAL HOSPITAL BOARD**

**GENERAL SURGICAL AND ORTHOPAEDIC REGISTRAR (Resident)**
**Metropolitan Hospital, E.8**
Candidates must possess F.R.C.S.
**SURGICAL REGISTRAR (Resident)**
**Victoria Hospital, Romford, Essex**
**SURGICAL REGISTRAR**
**(Resident or Non-resident)**
**Poplar Hospital, E.14**
**Recognized for F.R.C.S.**

Appointments subject to review after one year. Application forms from Secretary, 11, Portland Place, W.1, to be returned by October 6. (8315)

## Surgery—contd.

### ST. MARK'S HOSPITAL
**City Road, London, E.C.1**

Applications invited from Senior Registrars who have completed their training, or from Registrars who have completed their appointments, for two posts of

**RESIDENT SURGICAL OFFICER**

Part of time non-resident by arrangement. Salary at the rate of £1,400 or £965 respectively. Appointments tenable for six months from December 1 or January 1, with possibility further extension six months. Age, qualifications, experience, names two referees, to Secretary, Board of Governors, The Hammersmith, West London, and St. Mark's Hospitals, Du Cane Road, London, W.12, by October 6. (8316)

### SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**St. Stephen's Hospital, Chelsea, S.W.10**

**SURGICAL REGISTRAR**

Whole-time. Non-resident. Vacancy November, 1956. Post recognized for F.R.C.S. Application forms obtained from, and returned (within 14 days) to, Group Secretary, St. Luke's Hospital, Sydney Street, S.W.3. (Please enclose F.S.A.E.) (8343)

### HEREFORDSHIRE GROUP

**REGISTRAR IN GENERAL SURGERY**

Duties mainly at General (154 beds—71 surgical beds, including fracture and orthopaedic) and County Hospitals, Hereford (335 beds—40 surgical). Recognized for F.R.C.S. Resident. Application forms from Group Secretary, Victoria House, Eign Street, Hereford, to be returned before October 1, 1956. Candidates may visit hospitals. (8332)

### HERTS AND ESSEX GENERAL HOSPITAL
**(Formerly Haymeads Hospital)**
**Bishop's Stortford**

Applications are invited from Registered Medical Practitioners for the appointment of a whole-time

**TEMPORARY SURGICAL REGISTRAR**

to commence September 27, 1956, for one month in first instance, followed by engagement on a week by week basis. Applications, giving full details, together with copies of recent testimonials, or the names of referees, to the Group Secretary, Hertford H.M.C., County Hospital, Hertford, Herts. (8091)

### LEEDS REGIONAL HOSPITAL BOARD

**REGISTRAR in General Surgery**

Pinderfields General Hospital (70 general surgical beds). Resident, possibility of married accommodation. Recognition of post by the Royal College of Surgeons applied for. Applications, stating age, qualifications and details of present and previous appointments (with dates), together with the names and addresses of three referees, to the Secretary, Joint Registrars Committee, Park Parade, Harrogate, by September 28, 1956. (7974)

### MANCHESTER REGIONAL HOSPITAL BOARD

**Bury and Rossendale Hospital Management Committee**

Applications are invited for

**REGISTRAR IN SURGERY**

at Bury General Hospital. Post recognized for F.R.C.S. Applications, together with the names of two referees, should be sent to H. Wilkinson, Group Secretary, Bury General Hospital, Bury, Lancs. (8301)

### NEWCASTLE REGIONAL HOSPITAL BOARD

**Northallerton Hospital Management Committee**

**REGISTRAR SURGEON**

whole-time, resident, Friarage Hospital (340 beds). Accommodation available. Recognized for F.R.C.S. examination. Applications, with names and addresses of three referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield Road, Newcastle-upon-Tyne, 6, within fourteen days. (8256)

### NORTHERN REGIONAL HOSPITAL BOARD
**(Scotland)**

Applications are invited for the whole-time post of

**SENIOR REGISTRAR in General Surgery**

at the Inverness Group of Hospitals. Main duties are at the Royal Northern Infirmary, Inverness. Schedules of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by October 15, 1956. —A. M. Fraser, M.D., Secretary and Administrative Medical Officer, Office of the Northern Regional Hospital Board, Raigmore, Inverness. (8368)

### NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE

**Crumpsall Hospital**

Applications are invited for the post of

**REGISTRAR IN GENERAL SURGERY (R.S.O.)**

Recognized for F.R.C.S. Vacant October 6, 1956. Applications, with two referees, by October 1, 1956, to Group Secretary, Crumpsall Hospital, Manchester, 8. (8235)

### NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD

**GENERAL SURGICAL REGISTRAR**

(resident) required at Bedford General Hospital (439 beds). Hospital may be visited by direct appointment. Post vacant October. Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton Road, Bedford as soon as possible. (7698)

### SHEFFIELD REGIONAL HOSPITAL BOARD

**WHOLE-TIME RESIDENT OR NON-RESIDENT SENIOR SURGICAL REGISTRAR**
**(transitional appointment)**

required at City General Hospital, Sheffield, for one year in first instance. The successful candidate to reside at the hospital when "on call." Applications invited from Senior Surgical Registrars in their fourth or subsequent years and from those who held such posts for three years or more but vacated them after January 1, 1951. Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood Road, Sheffield, by October 1, 1956, giving age, nationality, qualifications, present and previous appointments (with dates), naming three referees. (7995)

### THE BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD

**North Gloucestershire Clinical Area**

Applications are invited by the above Boards for the joint appointment of

**REGISTRAR in General Surgery**

The appointment will be held for one year in the first instance, and be renewable for a further year. The successful candidate will be appointed to work for the first year mainly at Cheltenham General, Eye and Children's Hospitals, but may be required to undertake duties in other hospitals in the area. Applications, stating date of birth, qualifications and experience, together with the names and addresses of two referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park Road, Bristol, 8, not later than September 29, 1956. (8403)

### NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE

**Altrincham General Hospital**

**ASSISTANT SENIOR SURGICAL OFFICER**
**(J.H.M.O. Grade)**

Applications are invited for this post in a hospital of 130 acute beds with a busy Casualty Department. The appointee would be required to exercise control of this Department and also to assist R.S.O. with the general surgical work of the hospital. The post offers excellent opportunities of practical experience and postgraduate study to suitably qualified candidates and particularly those studying for higher surgical qualifications. Applications, with names of two referees, to Group Secretary, Sinderland Road, Altrincham. (7931)

### MILDMAY MISSION HOSPITAL
**Austin Street, Bethnal Green, London, E.2**

Applications are invited from registered medical practitioners for the post of

**RESIDENT SENIOR HOUSE OFFICER**

Recognized for the F.R.C.S. Vacant November 1, 1956. The appointment is for one year. Salary £745 per annum, less residential charges. Candidates should be in full sympathy with the evangelistic aims of the hospital. Applications and references to be addressed to the Medical Superintendent. (8348)

### ASHFORD HOSPITAL, Ashford, Kent

Applications are invited for the appointment of

**SENIOR HOUSE SURGEON**

at the above Hospital. The appointment will be tenable for a year. Salary £745 a year, less a deduction of £150 a year for residential emoluments. Applications, stating age, qualifications and the names and addresses of two referees, should be made to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone. (8290)

### BANBURY, OXON, HORTON GENERAL HOSPITAL (163 beds)

**SENIOR HOUSE OFFICER (Surgeon)**

required immediately. Hospital recognized for F.R.C.S. Active surgical department under direction of resident Consultant. Work in general surgical wards, with special responsibility for children. Four other residents. Application, with names of two referees, to the Secretary. (6952)

### BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE

**Bolton District General Hospital (604 beds)**

**RESIDENT SENIOR HOUSE OFFICER**

for general surgical duties. Vacant October 31, tenable for twelve months and recognized for F.R.C.S. Applications, with the names of two referees, to Group Secretary, The Royal Infirmary, Bolton. (8257)

### CLACTON AND DISTRICT HOSPITAL
**Clacton-on-Sea (58 beds)**

Applications invited for post of

**SENIOR HOUSE OFFICER**
**(Resident Surgical Officer)**

Post tenable for one year. Applications, with copies of three testimonials, to Group Secretary, Colchester H.M.C., 14, Pope's Lane, Colchester, Essex. (8374)

### COVENTRY AND WARWICKSHIRE HOSPITAL (354 beds)

**SENIOR HOUSE OFFICER**
**in General Surgery**

Vacant November 1. Resident. Recognized F.R.C.S. Apply Hospital Secretary. (8215)

### EPPING, ST. MARGARET'S HOSPITAL
**(480 beds)**

**RESIDENT SENIOR HOUSE OFFICER (Surgery)**

as Casualty Officer and Orthopaedic House Surgeon. Post vacant October 1, 1956. Recognized training post for F.R.C.S. Busy General Hospital with easy access to London. Salary on national scale, less deductions for board, lodging, etc. Applications, with copies of two recent testimonials, to the Group Secretary, Epping Group H.M.C., Oak Cottage, The Plain, Epping, Essex. (8009)

### GRIFFITHSTOWN, MON., COUNTY HOSPITAL
**(253 beds—Recognized F.R.C.S.)**

**SENIOR HOUSE OFFICER**

required mid-September. Post covers 35 beds. Recognized F.R.C.S. 6 months, and tenable 6 or 12 months as desired. Salary £745, less £150 board residence. Write, quoting two referees, to T. A. Jones, 64, Cardiff Road, Newport, Mon. (7481)

### GRIMSBY HOSPITAL MANAGEMENT COMMITTEE

**Scartho Road Hospital**

**RESIDENT HOUSE OFFICER (Surgical)**

required (Pre-registration or Senior House Officer Grade), for duties in acute surgical unit of 40 beds, modern theatre and O.P. Department. Offers excellent experience of all types of general surgery. Married quarters available. Applications, with names of two referees, to Hospital Secretary. (8216)

### MARGATE, GENERAL HOSPITAL (132 beds)

**SENIOR HOUSE OFFICER (Surgical)**

Recognized for F.R.C.S. and D.A. Salary £745 per annum, less charge for residential emoluments. Applications, with copies of testimonials, to Hospital Secretary. (7684)

### NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE

**Altrincham General Hospital, Annexe and E.N.T. Department (183 beds)**

**SENIOR HOUSE OFFICER (Surgical)**

This appointment affords excellent experience to suitably qualified candidates. Post recognized under F.R.C.S. regulations. Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland Road, Altrincham, Cheshire. (8236)

### NOTTINGHAM HIGHBURY HOSPITAL

**SENIOR HOUSE OFFICER (Surgical)**

required at the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Duties to commence on or about September 16, 1956. Applications, stating age, qualifications and experience and nationality, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham. (7174)

**IMPORTANT: All intending applicants should read the revised NOTICE at the top of page 28**

## Surgery—contd.

**PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE**

**(1) Queen Alexandra Hospital**
**SENIOR HOUSE SURGEON**
Recognized for the F.R.C.S. (87 surgical beds). Vacant now.

**(2) Royal Portsmouth Hospital**
**SENIOR HOUSE SURGEON**
Recognized for the F.R.C.S. (70 surgical beds). Vacant September 19, 1956.

Applications, stating age, experience and qualifications, together with the names of two referees, should be forwarded as soon as possible to E. H. Hurst, St. Mary's Hospital, Milton Road, Portsmouth. (6672)

**RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE**

**Caerphilly District Miners Hospital, near Cardiff (226 General beds)**

**SENIOR HOUSE OFFICER (General Surgery)**

Apply to Group Secretary, Central Offices, Caerphilly Road, Ystrad Mynach, Hengoed, Glam. (8422)

**ROTHERHAM, MOORGATE GENERAL HOSPITAL (355 beds, 38 cots)**

**SENIOR HOUSE OFFICER (Surgery)**

required. Residential emoluments £150 per annum. Applications to the Secretary, Hospital Management Committee, "Fern Bank," Doncaster Road, Rotherham. (8238)

**ST. ANTHONY'S HOSPITAL**
**Cheam, Surrey (162 beds)**

**RESIDENT SURGICAL OFFICER (S.H.O.)**

New post. Care of surgical cases under Consultant Staff. Approval for F.R.C.S. pending. N.H.S. rates. Apply to the Secretary. (8413)

**STOURBRIDGE (near), WORDSLEY HOSPITAL (478 beds)**

**SENIOR HOUSE OFFICER (Surgical)**

Post vacant October, 1956. Apply Group Secretary, Guest Hospital, Dudley, Worcestershire. (6842)

**WEST MANCHESTER H.M.C.**

**Park Hospital, Davyhulme**
**(General Hospital, 433 beds)**

**ONE SENIOR HOUSE OFFICER (General Surgery)**

required. Post vacant end-November. Application forms from Secretary. (8375)

**BATTERSEA GENERAL HOSPITAL**
**Battersea Park, S.W.11**

**HOUSE SURGEON/CASUALTY OFFICER**

Combined post. Vacant immediately. House Officer grade, not pre-registration and not recognized for F.R.C.S. Apply, enclosing copies of two recent testimonials, to Hospital Secretary, with whom arrangements can be made to view the Hospital. (8217)

**NORTH MIDDLESEX HOSPITAL**
**Edmonton, N.18**

**HOUSE SURGEON**

resident, required for November 1 for six months. General surgery and some E.N.T. surgery. Posts recognized for F.R.C.S. Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital by October 2. (8354)

**ROYAL MARSDEN HOSPITAL**
**Fulham Road, London, S.W.3**

Applications are invited from registered medical practitioners for the post of

**HOUSE SURGEON (Resident)**

to commence duty on November 10, 1956. Salary £525 per annum. The post is tenable for six months. Forms of application are obtainable from the House Governor, to whom applications, together with copies of three recent testimonials, should be sent not later than October 8, 1956. (8057)

**BIRMINGHAM ACCIDENT HOSPITAL**
**Bath Row, Birmingham, 15**
**(215 beds and 8 House Surgeons)**

**HOUSE SURGEON (Resident)**

vacant end September. Recognized for purpose of Casualty by R.C.S.(Eng.). Teaching programme by Consultant Staff. Appointment for six months, some of which may be spent, at applicant's request, in 42-bedded Medical Research Council's Burns Unit. Applications, naming two referees, to Administrator. (8218)

**BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE**

**HOUSE SURGEONS (Three)**

required for the following hospitals:

Royal Infirmary, Blackburn (262 general beds)—October 28 and November 1.

Queen's Park Hospital, Blackburn (640 mainly general)—November 1.

Applications to Secretary, H.M.C. Office, Royal Infirmary, Blackburn, Lancs. (8239)

**HULL "A" GROUP HOSPITAL MANAGEMENT COMMITTEE**

**Kingston General Hospital, Hull (419 beds)**

Applications are invited for the post of resident

**JUNIOR HOUSE SURGEON**

recognized for the F.R.C.S. examinations (Pre- or post-registration). Busy acute general surgical unit. Vacant October 1. Applications, with two recent testimonials, to the Hospital Secretary. (7944)

**KENT AND CANTERBURY HOSPITAL**
**Canterbury (277 beds)**

**GENERAL SURGICAL AND ORTHOPAEDIC HOUSE SURGEON**

The above post, which is recognized for the F.R.C.S. Diploma, is now vacant. N.H.S. salary and conditions. Applications, together with two recent testimonials, to be addressed to the Hospital Secretary at the above Hospital. (8288)

**STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE**

**Ashford Hospital, Ashford, Middlesex (560 beds)**

**RESIDENT HOUSE OFFICER (Male)**

required for general surgical and medical duties. Six months' appointment, not suitable for pre-registration candidates. Applications, stating age, qualifications and experience, with copies of up to three recent testimonials, to Medical Director of Hospital immediately. (8317)

**ST. ANDREW'S HOSPITAL, Bow, E.3**

Applications are invited for the appointment of

**HOUSE SURGEON**
**(Orthopaedic, E.N.T., and emergency surgery)**

Recognized pre-registration post. Vacant on October 21, 1956. Post is tenable for six months. Applications, stating age and qualifications, with copy of at least one testimonial, should be sent immediately to the Hospital Secretary, St. Andrew's Hospital, Bow, E.3. (Pr.8379)

**BIRMINGHAM, 18, DUDLEY ROAD HOSPITAL (780 beds)**

**HOUSE SURGEON**

required. Recognized for pre-registration and F.R.C.S. Unit of approximately 85 adult and children's General Surgical beds under control of 2 Consultant Surgeons. Detailed applications, with copies of three recent testimonials, to Group Secretary. (Pr.8097)

**DEWSBURY, YORKSHIRE, THE GENERAL HOSPITAL**

**HOUSE OFFICER (General Surgery)**

Applications are invited for the above pre-registration post, which is available immediately. Applications, giving full details and the names of three referees, should be sent to the Administrative Officer at the hospital. (Pr.8280A)

**EAST SURREY HOSPITAL**
**Shrewsbury Road, Redhill**

**RESIDENT HOUSE SURGEON**

Pre-registration appointment, vacant late September. Apply Hospital Secretary, naming two referees. (Pr.8240)

**HASTINGS—ROYAL EAST SUSSEX HOSPITAL (150 beds)**

**HOUSE SURGEON**

pre-registration post, vacant now. National scales of salary. Apply to Hospital Administrator. (Pr.8241)

**HITCHIN, HERTS. LISTER HOSPITAL**

Applications are invited for the post of

**RESIDENT HOUSE SURGEON**

Vacant October 16, 1956. Recognized as pre-registration post and for F.R.C.S. Applications to be sent to the Medical Administrator as soon as possible. (Pr.7977)

**HOSPITAL OF ST. CROSS (168 beds)**

**HOUSE OFFICER Pre-registration General Surgery**

Recognized F.R.C.S. Resident. Applications to Hospital Secretary. (Pr.7932)

**LEEDS REGIONAL HOSPITAL BOARD**

**HOUSE SURGEON**

Recognized Pre-registration posts will be available for the six months commencing November 1, 1956, in the following hospitals approved under the Medical Act, 1950:

Scarborough Hospital (191 beds)—2 vacancies
*County Hospital, York (222 beds)—1 vacancy
*City Hospital, York (178 beds)—1 vacancy (vacant December 1)
*Westwood Hospital, Beverley (202 beds)—1 vacancy
*Pontefract General Infirmary (100 beds)—1 vacancy
*Clayton Hospital, Wakefield (200 beds)—2 vacancies
*Pinderfields Hospital, Wakefield (663 beds)—3 vacancies.
General Hospital, Batley (99 beds)—1 vacancy (vacant now)
General Hospital, Dewsbury (119 beds)—1 vacancy (vacant now)
*Huddersfield Royal Infirmary (305 beds)—1 vacancy (vacant November 14)
Royal Halifax Infirmary (301 beds)—2 vacancies
Halifax General Hospital (425 beds)—1 vacancy
*Bradford Royal Infirmary (507 beds)—1 vacancy
*St. Luke's Hospital, Bradford (828 beds)—1 vacancy
*Keighley Victoria Hospital (144 beds)—2 vacancies (vacant October 1)
Otley General Hospital (170 beds)—1 vacancy
*St. James's Hospital, Leeds (1,539 beds)—5 vacancies
†Seacroft Hospital, Leeds (60 child surgical beds) 1 vacancy
*Harrogate General Hospital (253 beds)—1 vacancy

* Recognized for F.R.C.S.
† Recognized for D.C.H.

Application forms can be obtained from the Senior Administrative Medical Officer, Park Parade, Harrogate, or from the Dean, School of Medicine, Thoresby Place, Leeds, 2, and should be returned to either of the above named as soon as possible. Application may be made in advance of results of final examination. Candidates wishing to apply for posts at more than one hospital should complete a separate form in respect of each hospital. (Pr.7979)

**NUNEATON, MANOR HOSPITAL (125 beds)**

**HOUSE OFFICER Pre-registration General Surgery**

Recognized F.R.C.S. Resident. Applications to Hospital Secretary. (Pr.7933)

**PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP**

**South Devon and East Cornwall Hospital, Devonport**

**HOUSE SURGEON**

pre-registration post, vacant December 1, 1956, recognized for the F.R.C.S.—Arthur R. Cash, Group Secretary, 7, Nelson Gardens, Stoke, Plymouth. (Pr.7773)

**PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP**

**South Devon and East Cornwall Hospital, Greenbank Road, Plymouth**

**HOUSE SURGEON**

pre-registration post vacant December 1, 1956. Recognized for the F.R.C.S.—Arthur R. Cash, Group Secretary, 7, Nelson Gardens, Stoke, Plymouth. (Pr.7774)

**ROYAL SUSSEX COUNTY HOSPITAL (312 beds)**

**2 HOUSE SURGEONS**

required mid- and end October. Post recognized for pre-registration and F.R.C.S. Applications, stating usual particulars, and naming two referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7. (Pr.8327)

**STOKE-ON-TRENT, CITY GENERAL HOSPITAL (858 beds)**

**HOUSE OFFICER (General Surgery)**

Vacant now. Pre-registration post. Hospital recognized for F.R.C.S. Detailed applications with copy testimonials to Group Secretary, H.M.C., Princes Road, Stoke-on-Trent. (Pr.8208)

**TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE**

**Stockton & Thornaby Hospital, Stockton-on-Tees**

Applications are invited for the appointment of

**HOUSE OFFICER (Surgical)**

at the above Hospital. The appointment is recognized for pre-registration service under the Medical Act, 1950. Applications, stating full details, and giving two names for reference, to be addressed to the Hospital Secretary. (Pr.7945)

## THORACIC SURGERY

### NEWCASTLE REGIONAL HOSPITAL BOARD

**Regional Thoracic Service**

**TWO REGISTRAR THORACIC SURGEONS**

whole-time, resident, at Regional Thoracic Centre (150 beds), Shotley Bridge General Hospital. Work almost entirely non-tuberculous (cardiovascular, oesophageal and pulmonary) at an associated sanatoria. Applicants must have had good experience in general surgery and a higher qualification or its equivalent. Appointment intended either for a trainee in thoracic surgery or for a general surgeon seeking special experience. Single accommodation available. Applications, with names and addresses of three referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield Road, Newcastle-upon-Tyne, 6, within fourteen days. (8258)

### NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD, HAREFIELD HOSPITAL REGIONAL THORACIC SURGICAL UNIT

Applications are invited for the post of

**SURGICAL REGISTRAR**

to the Harefield Thoracic Surgical Unit, which serves the North-West Metropolitan Region. In the Hospital there are 90 beds for non-tuberculous surgical chest conditions, and 446 beds for Tuberculosis. The appointment thus affords a wide experience in all aspects of thoracic surgery. Candidates must have had previous surgical experience and preference will be given to candidates with a higher surgical qualification. The appointment will be held in the first instance for one year. Application forms obtainable from, and returnable to, the Secretary, Harefield and Northwood Group H.M.C., Mount Vernon Hospital, Northwood, Middlesex, by October 2, 1956. (8376)

### WEST MANCHESTER H.M.C.

**Park Hospital, Davyhulme**

**APPLICATION FOR RESIDENT SURGICAL REGISTRAR (Thoracic Unit)**

This Hospital is a General Hospital of 433 beds. It carries out by far the major part of the Manchester Region's Cardiac and Non-Tuberculous Thoracic Surgery, in addition to all other major specialties. The total number of resident medical staff is 20. The successful candidate will be expected to work with each of the three Consultant Thoracic Surgeons attached to this unit of 50 beds (including 10 children's beds). Applications are invited from suitably qualified and experienced male or female candidates. Application forms from the Secretary. (8339)

### LONDON CHEST HOSPITAL

**Hospitals for Diseases of the Chest**

A vacancy occurs for

**RESIDENT SURGICAL OFFICER**

Appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer or Registrar, according to qualifications and previous surgical experience. Applications, stating date of birth, qualifications (with dates) and previous appointments held, with copies of three testimonials, should reach the undersigned not later than September 26, 1956.—Thomas Brown, House Governor, London Chest Hospital, E.2. (8027)

### BIRMINGHAM, 9, YARDLEY GREEN HOSPITAL

**Thoracic Surgical Unit (66 beds)**

Vacancy for

**SENIOR HOUSE OFFICER**

No previous experience in thoracic surgery necessary. Applications, stating age, qualifications, training and experience, together with names of two referees, to be addressed to Group Secretary, Yardley Green Hospital, Birmingham, 9. (8069)

## UROLOGY

### THE UNITED LEEDS HOSPITALS

**The General Infirmary at Leeds**

**HOUSE OFFICER—Senior or Junior (Pre- or Post-Registration) required for Department of Urology**

Post tenable for six months from November 1, 1956. Salary according to grade. Terms and conditions of service for hospital medical staffs apply. Applications, stating age, qualifications, previous posts (with dates), and three names for reference, to be sent to the Secretary to the Board as soon as possible. (8080)

## VENEREOLOGY

### ST. MARY'S HOSPITAL, Paddington, W.2

Applications are invited from suitably qualified male candidates for the post of

**WHOLE-TIME REGISTRAR in the Venereal Diseases Department**

The appointment is for a first period of twelve months as from a date to be arranged, the holder being eligible for re-election. Applications, stating nationality, date of birth, qualifications, details of experience, together with dates and National Health Service gradings of previous and present appointments and names and addresses of three referees, should reach Alan Powditch, House Governor, not later than October 8, 1956. (8389)

### ST. THOMAS' HOSPITAL, London, S.E.1

**MEDICAL OFFICER to the Department of Venereal Diseases**

For a period of one year in the first instance, to carry out eight half-day sessions per week. £175 per annum per weekly session. Applications, naming two referees, to the Clerk of the Governors by October 3, 1956. (8283)

**IMPORTANT: All intending applicants should read the revised NOTICE at the top of page 28**

## PUBLIC HEALTH

### CITY OF BIRMINGHAM EDUCATION COMMITTEE

**SCHOOL MEDICAL OFFICER**

Applications are invited from registered medical practitioners (men or women) for appointment as School Medical Officer in the School Health Service. The possession of a D.P.H. or D.C.H. will be an advantage. Salary in accordance with Whitley Council scale of £1,050 by £50 to £1,200 by £55 to £1,475 per annum. Appointment is subject to the appropriate superannuation act and to the passing of a medical examination. Forms of application, obtainable from the undersigned (s.s.e.), must be returned not later than October 6, 1956. Canvassing disqualifies.—E. L. Russell, Chief Education Officer, School Health Service, Queen's College Chambers, 38a, Paradise Street, Birmingham, 1. (8045)

### CITY OF YORK EDUCATION COMMITTEE

**Child Guidance Clinic**

Applications are invited from suitably qualified persons for the post of

**PART-TIME PSYCHIATRIST**

to undertake duty at the Clinic for not more than six sessions per week (by arrangement) at a salary in accordance with the rates applicable to part-time Medical Consultants. Application form, with particulars of the appointment, may be obtained from the undersigned and should be returned as soon as possible and not later than October 8, 1956.—H. Oldham, Chief Education Officer, 5, St. Leonard's Place, York. (8320)

### CITY OF WAKEFIELD

**APPOINTMENT OF ASSISTANT MEDICAL OFFICER OF HEALTH**

Applications are invited for the above superannuable position from registered medical practitioners, preferably holding a qualification in public health, at a salary of £1,050 by £50 to £1,200 by £55 to £1,475, plus £40 per annum car allowance. Favourable consideration will be given to the granting of the tenancy of a flat, if required. Application on forms to be obtained from the Medical Officer of Health, to be returned to him, together with the names of two referees, not later than October 8, 1956. (8425)

### HUDDERSFIELD EDUCATION COMMITTEE

**SENIOR ASSISTANT SCHOOL MEDICAL OFFICER**

Applications are invited from fully qualified and registered medical practitioners for the above superannuable appointment. The salary is £1,150 per annum, rising by annual increments of £50 (3) and £55 (5) to a maximum of £1,575 per annum, and the point of entry will be fixed in accordance with qualifications and experience. A car allowance may also be paid. An additional £200 per annum is payable if the holder of the office is appointed in charge of the authority's Bacteriology Laboratory. Experience in School Health is essential. The possession of the D.P.H. or D.C.H. would be an advantage. Further particulars and application forms from the Principal School Medical Officer, Health Department, Ramsden Street, Huddersfield, to whom completed applications should be returned within three weeks of the appearance of this advertisement.—H. Gray, Chief Education Officer, Education Offices, Ramsden Street, Huddersfield (8031)

### COUNTY BOROUGH OF BURY

**CHIEF ASSISTANT MEDICAL OFFICER OF HEALTH and CHIEF ASSISTANT SCHOOL MEDICAL OFFICER**

Applications invited from male registered medical practitioners not over 45 years of age and possessing the D.P.H. or its equivalent for the above-mentioned appointment. Salary within scale £1,125 to £1,500 per annum. Applications, stating age, qualifications, and experience, and accompanied by copies of two recent testimonials, must reach me not later than October 6, 1956.—Edward S. Smith, Town Clerk, Town Hall, Bury. (8209)

### COUNTY BOROUGH OF WEST BROMWICH

Applications invited from registered medical practitioners for appointment of

**DEPUTY MEDICAL OFFICER OF HEALTH & DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER**

Salary scale £1,307, by four increments of £55 and one of £50 to £1,577. The Council have adopted conditions of service agreed by the Medical Council of the Whitley Councils for Health Services. Further particulars and form of application from the undersigned. Closing date for applications October 1, 1956.—J. M. Dyy, Town Clerk, Town Hall, West Bromwich. (8415)

### HALSTEAD URBAN DISTRICT COUNCIL HALSTEAD RURAL DISTRICT COUNCIL ESSEX COUNTY COUNCIL

**MEDICAL OFFICER OF HEALTH AND ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH**

Applications invited for the above-mentioned posts, which together constitute whole-time, 44.5% of time being devoted to duties as Medical Officer of Health to the District Councils and 55.5% to County Council duties. Applicants must possess the Diploma in Public Health.

Remuneration (in accordance with appropriate Industrial Court Awards) as follows:

(a) District Councils' salary—£863 6s. by £24 9s. 6d (4) to £961 4s. a year.

(b) County Council salary—£700 by £33 6s. 8d. (3) to £800 by £36 13s. 4d. (5) to £983 6s. 8d. a year.

Whitley Medical Council conditions apply and also relevant Standing Orders of the Employing Councils. Medical examination. Posts superannuable.

Application forms, obtainable from the Clerk of the County Council, County Hall, Chelmsford, returnable by October 6, 1956. Canvassing disqualifies. (8002)

### KENT EDUCATION COMMITTEE

**ASSISTANT COUNTY MEDICAL OFFICER**

required for North-East Kent area. Salary in the scale £1,050 by £50 to £1,200 by £55 to £1,475. Post superannuable. Duties mainly in School Health and Child Welfare Services. Experience in classification of educationally subnormal children an advantage. Applications, stating age, qualifications, experience and names of two persons to whom reference may be made as to professional ability and character, to Principal School Medical Officer, County Hall, Maidstone, by October 4, 1956. (8410)

### CHESHIRE COUNTY COUNCIL

**SENIOR ASSISTANT MEDICAL OFFICER**

Applications are invited from registered medical practitioners for appointment as Senior Assistant Medical Officer on the County Medical Staff. The work will be concerned mainly with children under five years of age, and will include assistance in supervising child welfare centres and the work of the health visitors. A knowledge of mental ill-health and its prevention in young children will be an advantage. The appointment is superannuable and subject to medical examination. The salary scale will be that applicable to Assistant Medical Officers, plus £125 at all stages, i.e., £1,175 by £50 to £1,325 by £55 to £1,600. Previous experience will be taken into consideration, and car and subsistence allowance will be paid according to the County Scale. Forms of application may be obtained from the undersigned, to whom they should be returned by October 20, 1956.—Arnold Brown, County Medical Officer, 24, Nicholas Street, Chester. (8270)

### NORFOLK COUNTY COUNCIL

Applications are invited from registered medical practitioners holding the Diploma in Public Health for appointment as

**SENIOR ASSISTANT MEDICAL OFFICER**

on headquarters staff. In addition to administrative work, the duties will include the medical examination of staff and deputizing for other medical officers. The salary scale (subject to Council approval) will be £1,343 10s. by £52 10s. to £1,606. Travelling and subsistence allowances will also be paid. Application forms, together with further particulars of the post, can be obtained from the County Medical Officer, 29, Thorpe Road, Norwich, to whom completed applications should be sent not later than October 8, 1956. (8269)

## Public Health—contd.

### STAFFORDSHIRE COUNTY COUNCIL
**Health Department**

Applications are invited from registered medical practitioners for a part-time sessional appointment, i.e. up to five half-days per week during school term, for B.C.G. vaccination. The remuneration will be £2 5s. per session of 1½ to 2½ hours and a casual car allowance will be paid. Further information can be obtained from the County Medical Officer of Health, County Buildings, Stafford, to whom applications should be sent by October 1, 1956.—T. H. Evans, Clerk of the County Council, County Buildings, Stafford. (8012)

### STAFFORDSHIRE COUNTY COUNCIL

**Biddulph Urban District Council**
**Leek Urban District Council**

Applications are invited for the separate
**PART-TIME APPOINTMENTS OF ASSISTANT COUNTY MEDICAL OFFICER and SCHOOL MEDICAL OFFICER, MEDICAL OFFICER OF HEALTH**
of the Biddulph Urban District and Medical Officer of Health of the Leek Urban District. The appointments together will constitute whole-time, the allocations being five half-days, three half-days and three half-days respectively. The proportionate salary for each appointment is calculated in accordance with the latest agreed scale, and increments will be given for previous service in the same capacity, the ranges being: County Council, £596 11s. 10d. by £28 8s. 2d. (3) by £31 5s. (5) to £838 1s. 4d. Biddulph Urban District Council, £501 16s. 4d. by £15 (4) to £561 16s. 4d. Leek Urban District Council, £501 16s. 4d. by £15 (4) to £561 16s. 4d. A car is necessary and an allowance will be paid. The posts are superannuable, and the successful candidate must pass a medical examination and produce his birth certificate. Applicants must be fully qualified medical practitioners with experience in public health duties, and must hold the Diploma of Public Health, or its equivalent. The candidate appointed will, as regards the County Council duties, act under the direction of the County Medical Officer of Health, and will be required to perform such duties as may from time to time be prescribed. As regards the duties of Medical Officer of Health, he will be subject to the Sanitary Officers (Outside London) Regulations, 1935 and 1951, and to the sole control and direction of the Urban District Councils. The County Council appointment will be subject to three calendar months' notice in writing on either side. Forms of application may be obtained from the County Medical Officer of Health, County Buildings, Stafford, and should be returned to him not later than the first post on October 2, 1956.—T. H. Evans, Clerk of the County Council; R. W. Trace, Clerk of the Biddulph U.D.C.; S. F. Eland, Clerk of the Leek U.D.C., County Buildings, Stafford. (8364)

### WESTMINSTER CITY COUNCIL AND HOLBORN BOROUGH COUNCIL

**JOINT APPOINTMENT OF PRINCIPAL ASSISTANT MEDICAL OFFICER OF HEALTH**
(permanent superannuable post). Salary £1,515 by £55 to £1,680 per annum. Applicants to be registered medical practitioners and to hold a registered Public Health qualification; age not to exceed 45 years. The person appointed will act as Principal Assistant Medical Officer of Health for the two Boroughs. His services will be allocated in the proportion of three-fourths to Westminster and one-fourth to Holborn. Further particulars from, and applications (marked "Principal Assistant Medical Officer of Health"), stating age, war service, qualifications, present and past appointments, with copies of three recent testimonials, to, the Town Clerk, Westminster City Hall, Charing Cross Road, W.C.2, by October 12, 1956. (8409)

## INDUSTRIAL APPOINTMENTS

**Attention is drawn to the B.M.A. scale of remuneration for Industrial Medical Officers, which is available on request from the Secretary**

### SOUTHERN GAS BOARD

**ASSISTANT MEDICAL OFFICER**

Applications are invited for the new and pensionable post of whole-time Assistant Medical Officer. Previous experience in Industrial Medicine would be an advantage. The salary will be on Senior Staff Scale, Grade D, £1,375 to £1,575, or Grade E, £1,525 to £1,725, or by arrangement with the successful applicant. The successful candidate will be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Board's Staff Pension Scheme. All applications must be made on a form which may be obtained from the Personnel Manager, Southern Gas Board, 164, Above Bar, Southampton, and completed forms should be returned by Monday, October 22, 1956.—P. Vafon Bennett, Personnel Manager. (8020)

# SHELL PETROLEUM COMPANY LIMITED

invites applications from suitably qualified medical practitioners for the post of

## MEDICAL OFFICER

for general duties. Candidates should be 30/35 years of age, have had at least four years' experience in hospital appointments, general practice or with H.M. Forces, and must be willing to serve in the Company's medical establishments both in the U.K. and overseas. Previous industrial or overseas experience is not essential. Commencing salary based on experience and not less than £1,650 per annum. Attractive Pension Fund. Please write in confidence to:

**Staff Department (R), Shell Petroleum Company Ltd., 16, Finsbury Circus, London, E.C.2**

## REPUBLIC OF IRELAND

### CLARE COUNTY COUNCIL

**SURGICAL REGISTRAR REQUIRED**

Immediate applications are invited for the post of Surgical Registrar at the County Hospital, Ennis. Salary: First year £800; Second year £900; Third year £1,000, plus in each year an additional sum of £100 a year if the holder of the post possesses a higher qualification in surgery. Temporary bonus at approved rate will also be paid. If board and residence is supplied a charge at the rate of £150 a year will be made. Applications should be addressed to the Secretary, County Home, Ennis. Dated this September 11, 1956. (8393)

### COMHAIRLE CONDAE NA GAILLIMHE

**VACANCIES FOR RESIDENT MEDICAL STAFF —GALWAY REGIONAL HOSPITAL**

Application forms and full particulars of the following whole-time, temporary posts may be obtained from the Secretary, Galway County Council, County Buildings, Galway, to whom completed forms should be returned so as to reach him on or before September 29, 1956:

**1 SENIOR HOUSE SURGEON (General)**
**1 SENIOR HOUSE SURGEON (Obstetrics)**
**1 SENIOR HOUSE PHYSICIAN (Pathology)**
**1 HOUSE SURGEON (General)**

Remuneration in each case is at the rate approved by the Department of Health. (8406)

### LOCAL APPOINTMENTS COMMISSION

**POSITIONS VACANT**
**COUNTY MEDICAL OFFICERS (A) CO. MAYO, (B) CO. DONEGAL**

Salary scale in each case: £1,623 to £1,847. Application forms and particulars from the Secretary, Local Appointments Commission, 45, Upper O'Connell Street, Dublin. Latest time for receiving completed application forms: 5 p.m. on October 5, 1956. (8412)

## OVERSEA (Vacant)

**LOCUM FOR SIX MONTHS FROM MID-**October in general practice at Port Moresby (Papua and New Guinea), including some midwifery. Possibility of taking over practice. £150 sterling tax-free and all found, plus half air fare. Interview in London. Apply, with brief particulars, Box 1765, B.M.J.

**VICTORIA (AUSTRALIA)**

Medical Practices and Partnerships are now available for transfer. Locum engagements arranged for G.P.s immediately on arrival in Melbourne.—Allan Grant, Medical Agent, 54, Collins Street, Melbourne, Victoria. Cables: Allgra, Melbourne.

**ENGLISH, IRISH, SCOTTISH OR WELSH** Doctor (male) required, Pusan, Korea. General Medical qualifications. Salary £1,000 to £1,250 depending on experience, plus board and accommodation. One to two year contract. Apply Foreign Relief Secretary, Save the Children Fund, 12, Upper Belgrave Street, S.W.1. Tel.: Sloane 9171. (6432)

**AUSTRALIA. INDUSTRIAL MEDICAL** Officer required as second doctor by large Mining, Milling, and Smelting Company in Mount Isa, Queensland. Wide general experience necessary, age about 35 years. Salary, £A.1,800 to £A.2,200 per annum, plus bonus of approximately £A.500 per annum. Superannuation scheme. Apply in first instance to Mount Isa Mines Limited, Adelaide House, King William Street, London, E.C.4. Closing date for applications, October 31, 1956. (8411)

**BRITISH PETROLEUM COMPANY LIMITED** requires a **Medical Officer** (male General Practitioner, single) for service in the Middle East. Candidate must be registered in the British *Medical Register* and aged between 26 and 32 years. Duties will consist of practice in a well equipped base Hospital of 90 beds and relief on exploration projects. In the case of one appointment preference will be given to those with experience in Anaesthesia. Minimum commencing salary £1,600 plus generous allowance in local currency. Pension scheme, good leave arrangements, kit allowance. Full particulars can be obtained by writing, giving full details of qualifications and a brief account of career, quoting F.88, to Box 1868, B.M.J.

**CHIEF MEDICAL OFFICER REQUIRED BY** British Mining Company operating in Burma. Salary and allowances £2,365 per annum, plus free living accommodation, domestic help and accident insurance. Travelling expenses of wife and children paid by the Company. Contract for 38½ months, with 2½ months' leave on full pay every 18 months.—Applications, stating age, qualifications and experience, to Box 1857, B.M.J.

**CATHOLIC MISSION HOSPITALS.** VACANcies in East and West Africa and India.—Apply Secretary, Damien Society, 47, Fitzwilliam Square, Dublin. (7130)

### AUCKLAND HOSPITAL BOARD, New Zealand

Applications are invited from medical practitioners eligible to qualify as a "Junior Specialist" under the Hospital Employment (Medical Officers) Regulations, 1952, for the position of

**JUNIOR MEDICAL SPECIALIST**
**Chest Unit, Green Lane Hospital**

The appointment is a full-time one for a period of 12 months from date of taking up duty. If during that period the appointee has satisfactorily carried out the duties of the position and if he so desires, an extension of the term for a limited period would be considered by the Board. The position is non-residential. A higher qualification is desirable but not essential. Salary £(NZ)1,600 per annum, rising to £(NZ)1,900 per annum by annual increments of £(NZ)50. Commencing salary within this scale according to qualifications and experience in the specialty. Conditions of appointment and form of application obtainable from the office of the High Commissioner for New Zeland, New Zealand House, 415, Strand, London, W.C.2. Applications, addressed to the undersigned at the office of the Board, Kitchener Street, Auckland, New Zealand, close at noon on Friday, October 19, 1956.—R. F. Galbraith, Secretary. (8168)

### AUCKLAND HOSPITAL BOARD, New Zealand

Applications are invited from qualified medical practitioners of the British Commonwealth who are eligible to qualify as a "Senior" or "Junior Registrar" for the position of

**SENIOR or JUNIOR REGISTRAR to the Cardio-Surgical and Thoracic Surgical Units, Green Lane Hospital**

The appointment is a full-time one for a period of 12 months from date of taking up duties. If during this period the appointee has satisfactorily carried out his duties, and if he so desires, an extension of the term for a limited period would be considered by the Board. It is desirable that the appointee commence duty as soon as practicable. The position is non-residential. Salary: "Junior Registrar" £(NZ)1,060 per annum, rising by one annual increment to £(NZ)1,115 per annum, inclusive of living-out allowance. "Senior Registrar" £(NZ)1,170 per annum, rising by three annual increments to £(NZ)1,330 per annum, inclusive of living-out allowance. (Commencing salary within this scale according to qualifications and experience in the specialty.) Conditions of appointment and form of application may be obtained from the Office of the High Commissioner for New Zealand, New Zealand House, 415, Strand, London, W.C.2. Applications close with the undersigned at the office of the Board, Kitchener Street, Auckland, C.1, N.Z., at noon on Friday, October 19, 1956.—R. F. Galbraith, Secretary. (8169)

### GOVERNMENT OF BAHAMAS

Applications invited from doctors with qualifications registrable in the United Kingdom for the following vacancies:

**(a) ASSISTANT MEDICAL OFFICER**

for duty at Princess Margaret Hospital or elsewhere as required by the Chief Medical Officer

**(b) DISTRICT MEDICAL OFFICER**

for duties in a specified area. Appointments on permanent basis with pension (non-contributory) or on agreement for three years in first instance. Salary £1,400 a year. No income tax. Unfurnished quarters or rent assistance. Free passages on appointment for officer, wife and up to two children and, if appointed on agreement, free passages back to United Kingdom on completion of engagement. Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD 117/27/02). (8400)

## Oversea (Vacant)—contd.

**ROYAL PERTH HOSPITAL, Western Australia**

**STAFF RADIOTHERAPIST**

Applications are invited for the above full-time post as Staff Radiotherapist, who will work under the direction of the Honorary Radiotherapists. Salary within the range of £2,360/£2,540 per annum, according to qualifications and experience, and provided the applicant has the Diploma of Radiotherapy or the equivalent. Applicants without a complete Diploma will receive a salary of £2,097 per annum. The Royal Perth Hospital is the main Teaching Hospital associated with the University of Western Australia. It has more than 600 beds and is extending. In addition to all relevant personal details, applications must include particulars of qualifications, experience, and the names of two referees; and should reach the undersigned on or before October 31, 1956.—Joseph Griffith, Administrator. (7790)

**SARNIA GENERAL HOSPITAL**
**Sarnia, Ontario, Canada**

**RADIOLOGIST**

required immediately as assistant to Director of Radiology. Well-established hospital, 265 beds. Modern department. Must be eligible for certification by Royal College of Physicians and Surgeons of Canada in diagnosis and therapy. Commission basis with maximum of $12,000 per annum. Age limits between 30 and 40. Write: Administrator, Sarnia General Hospital, Sarnia, Ontario, Canada. (7920)

**SASKATCHEWAN DEPARTMENT OF PUBLIC HEALTH**
**Cancer Clinic, University Hospital, Saskatoon, Saskatchewan, Canada**

**SENIOR CANCER CLINIC ASSOCIATE**

required for the above Clinic. Salary: $828.00 per month with automatic annual increases to $994.00 per month. Requirements: Certification by the Royal College of Physicians and Surgeons of Canada or its equivalent. Applicant should be an Internist and have considerable experience in investigation and diagnosis of cancer cases. For application forms or further information write Personnel Officer, Provincial Health Building, Saskatchewan Department of Public Health, Regina, Saskatchewan. (7919)

**THE REPUBLIC OF THE SUDAN**

The Ministry of Health invite applications for the post of

**SURGICAL SPECIALIST**

Candidates must possess the necessary professional qualifications, viz., F.R.C.S. or its internationally recognized equivalent. Age between 28 and 48. Salary range £E.1,750 to £E.2,330 (for Junior Specialists) or a flat £E.2,330 for Specialists. Candidates for this post may apply for secondment from the National Health Service for a period of up to three years under the terms of the circular letter No. RHB/(52)106EG(52)101 of September 30, 1952. The appointment will be on a Short Term Contract for a period up to 5 years. Starting salary will be determined according to age and qualifications. A Bonus of one month's salary for each completed year of satisfactory service will be payable and an Outfit Allowance of £E.50 on signature of Contract. Further particulars and application form can be had on application to Dr. E. P. Pratt, 137, Harley Street, London, W.1. (8114)

**UNIVERSITY OF THE WITWATERSRAND**
**Johannesburg, South Africa**

Applications are invited for appointment to a post of

**SENIOR LECTURER and a post of LECTURER**

on the staff of the University's Department of Physiology, Medical School. Candidates with a medical qualification or a higher degree in experimental physiology and/or biochemistry are eligible for appointment. The salary scale attached to the post of Senior Lecturer is £1,100 by £50 to £1,450, and to the post of Lecturer £850 by £50 to £1,150. In addition, a married man will receive cost of living allowance at the rate of £234 per annum. The commencing salary will depend upon qualifications and experience in teaching and research. Membership of the Provident Fund is compulsory and involves a contribution at the rate of 7 per cent of the salary paid, the Government and the University together contributing an equal amount. Membership of the Staff Medical Aid Fund is compulsory in the case of an officer who is found eligible for membership. Applicants are advised to obtain a copy of the information sheet regarding the above vacancies from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon Square, London, W.C.1. Applications close in South Africa and London on October 31, 1956 (8419)

**UNIVERSITY COLLEGE, Ibadan, Nigeria**

Applications are invited for

**SENIOR LECTURESHIP IN RADIOLOGY**

The appointee will also be Director of the clinical Department of Radiology in the new teaching hospital. Initial appointment three years. Salary scale: £1,850 by £100 to £2,450 per annum. Allowance up to three children, £50 per annum per child resident in Nigeria and £100 per annum per child resident elsewhere. Part furnished accommodation at rent up to 7.7 per cent. of salary. Passages for appointee, wife, and up to three children under 11 years on appointment, overseas leave and termination. F.S.S.U. Outfit allowance £60. Detailed applications (ten copies), naming three referees, by October 5, 1956, to Secretary, Senate Committee on Colleges Overseas in Special Relation, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained. (8351)

**WANTED, INTERNS FOR JULY, 1957. SALARY** $100 monthly with full maintenance. 12 months' rotating service. Teaching programme. Write, Thomas J. Quigley, M.D., St. Vincent's Hospital, Staten Island 10, New York, N.Y.

## UNIVERSITY AND RESEARCH APPOINTMENTS, etc.

**UNIVERSITY OF BRISTOL**

The University invites applications for the post of

**LECTURER IN OBSTETRICS AND GYNAECOLOGY**

Salary £1,200 by £100 to £1,750 per annum, according to qualifications and experience, together with superannuation and children's allowances. The successful candidate will be granted an honorary contract as Senior Registrar with the Board of Governors of the United Bristol Hospitals and the S.W. Regional Hospital Board. Twenty copies of the application including the names of three referees, should reach the Registrar, from whom further particulars may be obtained, not later than October 6, 1956 (8407)

**UNIVERSITY OF EDINBURGH**
**Medical Physics Unit**

Applications are invited for the post of

**DIRECTOR of the Medical Physics Unit**

with status of Senior Lecturer. This Unit is being established jointly by the University and the South-Eastern Regional Hospital Board, Scotland. Salary scale £1,750 by £100 to £2,250 per annum, with superannuation benefit and, where applicable, family allowance. Further particulars may be obtained from the Secretary to the University, Old College, South Bridge, Edinburgh, with whom applications, giving the names of three referees, should be lodged by November 1, 1956. (8055)

**UNIVERSITY OF LIVERPOOL**

Applications are invited for a post in the Department of Physiology, from

**Medically qualified candidates, as an ASSISTANT LECTURER**

at an initial salary of £700 per annum, or as a Lecturer at an initial salary within the range of £1,000 to £1,200 per annum, according to qualifications and experience, or from

**Non-medically qualified candidates, as an ASSISTANT LECTURER**

at an initial salary of £550 per annum (in special circumstances £600 per annum), or as a Lecturer at an initial salary within the range of £650 to £800 per annum, according to qualifications and experience. Applications, stating age, academic qualifications and experience, together with the names of three referees, should be received not later than October 6, 1956, by the undersigned, from whom further particulars of the conditions of appointment may be obtained.—Stanley Dumbell, Registrar. (8385)

**UNIVERSITY OF OXFORD**
**Department of Pathology, Radcliffe Infirmary**

Applications are invited for the post of

**SENIOR RESEARCH OFFICER in Neuropathology**

for a period of five years in the first instance. Salary scale £1,000 by £50 to £1,700; F.S.S.U. and family allowance. The successful candidate will be expected to take up duties in the early part of Michaelmas Term, 1956. Preference would ordinarily be given to candidates with experience in neuropathology, but favourable consideration would be given to candidates experienced in general morphological pathology who would wish to specialize in neuropathology. In addition to some teaching duties and facilities for research, the duties include the investigation of the neurosurgical and neurological specimens of the United Oxford Hospitals. Applications, with the names of two referees, should be sent by October 6 to Dr. A. H. T. Robb-Smith, Department of Pathology, Radcliffe Infirmary, Oxford, from whom further particulars may be obtained. (8010)

## SCHOLARSHIPS

**DICKINSON SCHOLARSHIPS**

Applications are invited for a

**RESEARCH SCHOLARSHIP**

in Medicine or Surgery, value £150. Candidates must be graduates of any University, who have taken their full course of instruction in Medicine and Surgery at the University of Manchester and at the Manchester Royal Infirmary. Copies of the regulations governing the Scholarships may be obtained from the undersigned, to whom six copies of application should be sent, not later than September 30, 1956.—G. H. Taylor, Secretary to the Dickinson Scholarship Trustees, Manchester Royal Infirmary, Manchester, 13. (8423)

## PERSONAL

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Two Courses of Clinical Demonstrations, open to Postgraduates, will be held at The National Hospital, Queen Square, on Wednesdays at 4 p.m. from October 10 to December 19, 1956, inclusive, and on Saturdays at 10.30 a.m. from October 6 to December 15, 1956, inclusive. The fee for attending either of these courses is two guineas. Application for a ticket should be made to the Dean, Institute of Neurology (Queen Square), The National Hospital, Queen Square, W.C.1, and a remittance to cover the fee enclosed. Only postal applications will be considered. (8377)

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**UNIVERSITY OF LONDON**
**(British Postgraduate Medical Federation)**

**INSTITUTE OF NEUROLOGY (Queen Square)**

A Course of Lectures in Neurology at an advanced level will be given in the Lecture Theatre, The National Hospital, Queen Square, London, W.C.1, at 5 p.m. on Monday and Fridays from October 8 to December 17. The fee for attending the whole course will be three guineas, or for a single lecture 7s. 6d. A copy of the programme may be obtained on application to The Dean, Institute of Neurology (Queen Square), The National Hospital, Queen Square, London, W.C.1 (8408)

## Educational and Lectures—contd.

### INSTITUTE OF UROLOGY

IN ASSOCIATION WITH ST. PETER'S, ST. PAUL'S AND ST. PHILIP'S HOSPITALS

WEEK-END COURSE ON

### "ESSENTIALS OF UROLOGY" October 5–7, 1956

| Date | Time | Title | Lecturer | Place |
|---|---|---|---|---|
| Fri., Oct. 5 | 2.0 p.m. | Operating Session .. .. | MR. J. D. FERGUSSON | Central Middlesex Hospital |
| | 8–9 p.m. | Lecture, Deformities of the Genitalia | MR. D. I. WILLIAMS .. | Institute of Urology |
| Sat., Oct. 6 | 10 a.m. to 11 a.m. | Lecture, Renal Physiology in Urology | DR. A. R. HARRISON . | Institute of Urology |
| | 11.30 a.m. to 12.30 p.m. | Lecture, Treatment of Tuberculosis of the Genito-Urinary Tract | MR. H. G. HANLEY .. | Institute of Urology |
| | 2–3 p.m. | Lecture, Neoplasia of the Prostate | DR. L. M. FRANKS .. | Institute of Urology |
| | 3.30 p.m. to 4.30 p.m. | Lecture, Endocrine Control Therapy | MR. J. D. FERGUSSON . | Institute of Urology |
| Sun., Oct. 7 | 10 a.m. to 11 a.m. | Lecture, Treatment of Carcinoma of the Bladder: (1) Radium | MR. A. R. C. HIGHAM | Institute of Urology |
| | 11.30 a.m. to 12.30 p.m. | Lecture, Treatment of Carcinoma of the Bladder: (2) Other Methods | MR. D. M. WALLACE | Institute of Urology |
| | 2–3 p.m. | Museum Demonstration .. | DR. R. C. B. PUGH .. | Institute of Urology |
| | 3.30 p.m. to 4.30 p.m. | Film, The Image Intensifier | DR. J. J. STEVENSON .. | Institute of Urology |

Fee for the course, 5 guineas. Applications to the Secretary, Institute of Urology, 10, Henrietta Street, Covent Garden, W.C.2.

### UNIVERSITY OF LONDON

(BRITISH POSTGRADUATE MEDICAL FEDERATION)

**INSTITUTE OF NEUROLOGY**

(QUEEN SQUARE)

A Course of Lectures on

"INFECTION AND INFESTATION OF THE CENTRAL NERVOUS SYSTEM"

will be given in the Lecture Theatre at the National Hospital, Queen Square, London, W.C.1, on Wednesdays at 5.30 p.m. on the following dates:

| | | | |
|---|---|---|---|
| Wed., Oct. | 3 .. | Pyogenic Meningitis .. .. .. .. | DR. J. HAMILTON PATERSON |
| " " | 10 .. | Granulomatous Meningitis .. .. .. | DR. R. W. GILLIATT |
| " " | 17 .. | Virus Infections .. .. .. .. | DR. P. SANDIFER |
| " " | 24 .. | Encephalomyelitis .. .. .. .. | DR. P. SANDIFER |
| " " | 31 .. | Encephalomyelitis with Lymphadenopathy .. | DR. HELEN DIMSDALE |
| " Nov. | 7 .. | Spinal Abscesses .. .. .. .. | DR. M. KREMER |
| " " | 14 .. | Intracranial Abscesses .. .. .. .. | MR. VALENTINE LOGUE |
| " " | 21 .. | Syphilis of the Central Nervous System—I .. | DR. J. ST. C. ELKINGTON |
| " " | 28 .. | Syphilis of the Central Nervous System—II .. | DR. J. ST. C. ELKINGTON |
| " Dec. | 5 .. | Cerebral and Spinal Thrombophlebitis .. | DR. M. J. MCARDLE |
| " " | 19 .. | Infestations of the Central Nervous System .. | DR. R. A. HENSON |

The fee for the full course will be three guineas, or for a single lecture 7s. 6d. Tickets may be obtained on application to the Dean, Institute of Neurology (Queen Square), The National Hospital, Queen Square, London, W.C.1.

### THE UNIVERSITY OF LIVERPOOL DEPARTMENT OF STUDIES IN PSYCHOLOGICAL MEDICINE

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**UNIVERSITY OF LONDON:** A course of two lectures on "**Pulmonary Function: Tests and Interpretation**" will be given by Professor J. H. Comroe (Pennsylvania) at 5.15 p.m. on September 24 and 25 at the Royal Free Hospital School of Medicine, 8, Hunter Street, Brunswick Square, W.C.1. Admission free without ticket.—James Henderson, Academic Registrar. (8396)

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